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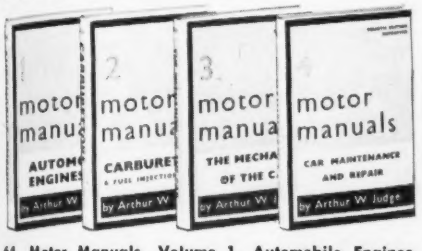


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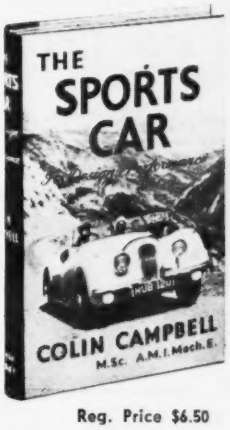


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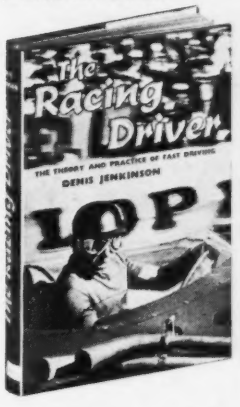


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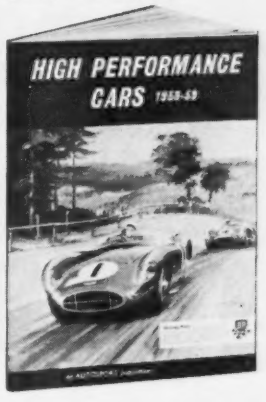


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*September 1959 No. 15 Vol. 5*


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► For a year or so now we've watched the burgeoning kart movement, first with amusement, then with amazement and now, finally, with sincere admiration. This smallest of all adult-partaken motor sports has, as we noted a couple of months ago, grown to fantastic proportions. The manufacturer that began it all is working two shifts to supply the demand and so are several others.

Karting is now far beyond the fad stage. No longer are most people amused at the thought of grown men riding those little toys. Toys they are not. The larger modified karts go like blazes; 50 miles an hour is not out of the question with a modified single engine, 70 or more has been seen with the full-race twin-engine beasties and there are lots of these. In brief, karting has become a national sport. And even more. Karts are being exported all over the world, particularly the English-speaking world.

Several "national" kart races have been held this summer by various promotors and clubs. Now the word is out that an *international* kart race is scheduled. No joke; the race is a scheduled part of the Bahamas Speed Week, a full international FIA event.

It's quite obvious that the sport of karting is out of the parking lot stage. As such it needs universal rules if it is to continue. Fortunately, almost from the outset, there has been a central controlling body which has set up an eminently satisfactory rule book. The regulations are based on experience and make sense. Further they are written with the specific purpose in mind to allow anyone to race a basic kart and still allow, through a class system, virtually all the modifications and improvements one can make. Actually there are two ruling groups. The first one is the West Coast based Go Kart Club of America—the ones who wrote the rule-book mentioned above. The other is the Grand Prix Karts Club of America which professes to adhere to a similar set of rules under a "Formula K."

Unhappily these two groups show signs of competing with each other rather than cooperating to make their sport truly national. Perhaps it is a shade too early to expect universality in a sport that is so new but we'd rather see intramural political jockeying stopped before it starts. Such intergroup rivalries in one phase or another of motor sport have harmed those phases immeasurably. Midget and sprint racing are two cases in point. Sports car racing has definitely suffered from time to time in certain areas because of this. These forms of motorsport are hardly as universal as karting wherein one can just heave the kart into the trunk of the family car and head for nearest race. In a sport of such mass appeal only chaos can result from intergroup infighting. Nuff said for now.

* * *

Because of the huge number of karts and parts for karts now available, next month we will run a round up on karts and where to get them as well as the accessories that make them go. The choice is wide and from this round-up readers can pick the kart that suits him best from the bare kit to the really wild custom-built machines. You'll find a kart for every purse and every taste. If you're at all interested in karting, don't miss it.

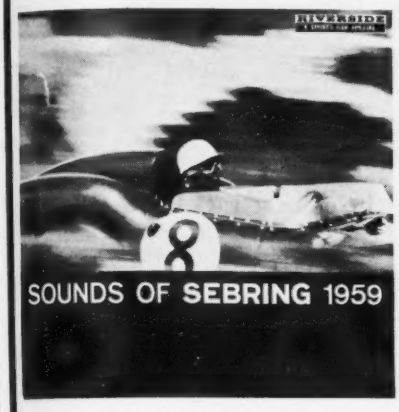
* * *

Also coming up next month is the second annual SCI Sports Car Club of the Year. Once again the staff of SCI has sifted through the country's sports car clubs for one single club that has made a unique contribution to motorsport in particular and automobile enthusiasm in general either nationally or within its own area. It wasn't an easy choice—from a list of hundreds it was narrowed down to 10 and then to five. At that point it became a matter for real thinking. One thing we can assure you—the club that got the final vote is a truly outstanding organization. Read about it next month.

*—john christy*


**Good heavens, man— are you aware that I'm a BUGATTISTE?**

# SEBRING 1959

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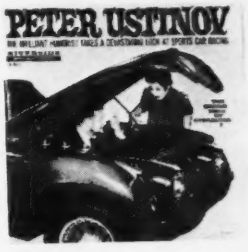


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# letters

## COVER CAR

When I received my July 1959 issue of Sports Cars Illustrated yesterday, I was most pleasantly surprised. The cover illustration of the red Mercedes Benz 540-K roadster is a beautiful photograph of a wonderful automobile.

The reason I was thrilled and felt considerable pride in seeing the photograph is that I am now the owner of that automobile. I purchased the automobile through Mr. Leonard Potter of the Vintage Car Store in November 1958. At the time of our negotiations for this car he had informed me that some photographs of the car had been made for your magazine.

For your interest, some information about the car follows. It was purchased and owned by one man in Zurich, Switzerland from its production in 1937 until Spring of 1958. At that time the car became available to Mr. Leonard Potter and I heard about the car in May 1958 but finally purchased it in November 1958. My brother and I drove the car from New York City to Dallas in thirty hours driving time, approximately 1800 miles. We left New York City at 5:30 P.M. on Saturday evening and did not make a stopover until we reached St. Louis on Sunday afternoon. After a few hours rest we were again on our way to Dallas. This automobile performed excellently at highway speeds, the speedometer registering between 100 and 120 km per hour for most of the trip. The supercharger engaged satisfactorily, its use producing an awesome sound and sensation. Gasoline consumption was approximately ten miles per gallon but with a thirty-gallon tank this created no particular problem. I believe the roadability of this automobile is still as excellent as it was when new and find it not at all difficult to drive. Its excellent steering and throttle response at highway speeds gives the true feeling of a sports car, although a big one.

Your readers might be interested to know that this car weighs slightly more than 5000 pounds. It is a straight 8-cylinder engine, 5.4 liter with a single overhead camshaft. It is rated at 115 horsepower and when the super-charger is engaged the horsepower rating is 180 horsepower. Top speed of a model 540-K was in the neighborhood of 105 to 110 miles per hour when new.

H. A. Mueller, M.D.
Dallas, Texas

## FIAT FUN

Your road test of the Fiat 600 Multipla was fascinating and I am overjoyed to see that somebody else has found that it is one of the biggest little cars on the road.

Nardi has a "hopped-up" cousin in our family, and our "Mighty Mo" was purchased in Italy too. It carted about 1200 lbs. of people and luggage over 5,000 miles of European roads last summer.

Aside from one of the bigger, more comfortable sports cars I would choose the Multipla for the New York to L.A. trip. As a student at Colorado College I trek across the country to New York at least twice a year and for ten to twelve hour stretches the Fiat is more comfortable than any American car I've ever ridden in. The Multipla has a straighter and less squishy seat (than an American car). It is foam rubber, but only two or three inches instead of six.

Of course, it isn't perfect. I've had to replace three or four things; gas, oil, brake fluid and a choke cable. (Too many early morning cold Colorado starts for the ski slopes.)

I'm on the road right now and headed back to New York with two passengers, eight trunks (luggage rack), boxes, a dog (Boxer), lots of room and more fun than General Motors ever dreamed of.

Gail L. McGuire
Webster, N.Y.

## SUPER SPRITE

I would like to know who makes the hard top, and the price of the wire wheels as shown on the Sebring Sprites. Are these available from the factory?

Carl M. Schentes
Fleet Post Office, N.Y.

**The hard tops on the Sebring cars were prototype models and will be a production item in the near future. The wire wheels and other accessories are listed as factory items, but at the moment all production of these parts is being channeled into the building of complete "Sebring Replica" Sprites. As soon as the supply is sufficient all the accessories will be available on order.**

## CHEV

In your July issue, an anti-Chev letter received what I consider to be an ungentlemanly and unintelligent reply. I am not wholly on your or Mr. Weaver's side, but I have been becoming more and more impatient at the unwarranted amount of space being given to every Chev-engined special and conversion that comes along. Sure, give attention to the most successful of these, but let's not overdo it.

My primary aim in writing is to inquire as to just what you took into consideration in making your statement as to the Corvette engine being, ". . . perhaps the most successful sports-racing engine going on American road circuits." I admit that I have not had the pleasure of attending races at Marlboro or Riverside or Lime Rock, but we have a few races down here, not just Sebring and Daytona Beach, but many regional races as well; and in attending the majority of these races and in reading about others, I have yet to see any spectacular results which would give backing to your extravagant Corvette praise; with the exception of Lance Reventlow's Scarabs, which individual cars received such prodigious expenditures of time and labor as to make Enzo Ferrari et al seem like a bunch of thrifty weekend amateurs. The majority of these Chevy cars have shown great promise and speed, with their five-plus liter engines, when they ran, but have usually proven to be more worry for their mechanics than for opposing drivers. To give such praise to Corvette-engined machinery is to be seemingly unaware of the performances of Ferrari, Porsche and Lister-Jag etc., and this is unforgivable in a magazine supposedly dealing in facts.

I feel that there should be more time spent on obtaining a decent American three-liter engine that can legally race in Europe, rather than all the effort being put into all this Lister Chevy and Maserati-Pontiac nonsense that never stay together long enough to finish a race, as witness Daytona Beach and Pomona to name two recent examples. Maybe if Reventlow gets his three-liter, or 2.5, engine built it will wake some people to the fact that if we are going to beat the Europeans, the first thing we have to have is a car that we can enter in European races.

Joe Vastine
Bartow, Florida

What's come over you magazine editors lately? Mr. Joseph Weaver writes you a letter which was published in the July issue of SCI. His letter contains an honest opinion stating that he dislikes forty pages devoted to one car and you blow your top.

What he had to say about the Corvette, and your magazine's treatment of it, also applies to the other magazines in the sports car field. It looks very much like someone is being pressured into some editorializing causing a guilt complex reaction.

"Made in Italy", "Made in England", "Made in Germany", means little to me except for the fact that they make, in those countries, the truly *great* sports cars.

I am not mad at anybody when I say that. I have studied sports cars for seven years both from the engineering as well as the mechanical standpoint. That is why I make the above statement.

Instead of accusing Mr. Weaver of disliking anything that doesn't have a foreign label, let's reverse the picture entirely. My opinion is that if . . . the 4.5 Corvette was a foreign made car it would receive little praise or comment from you. Its rocker arm construction, for instance, would be criticised and possibly a recommendation for dual overhead cams etc. etc.

Our fine American sense of sportsmanship would be completely outraged if it were raced against smaller machinery by virtue of a conveniently adjusted classification.

It would, in brief, be passed off as a rather mediocre piece of machinery which could *almost* always beat other cars of half to two-thirds its piston displacement.

R. C. Nicholson
Middletown, N. Y.

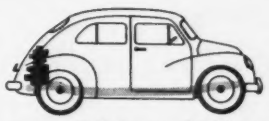
**We make no apologies for our praise of the Corvette engine. It *is* a good engine, even more so when it is realized that it is a production item. This fact, however, is a two-sided coin. Because it is a production engine, it is readily available at a not very exorbitant price. At the same time, it is not specifically designed to be used in a sports car that will meet FIA specifications, but rather to power our domestic automobiles, which are big. Car builders who want large amounts of dependable power without a ridiculous price tag have little choice other than the light Corvette. As long as no international wins are sought, it's a pretty smart choice.**

*(Continued on page 10)*

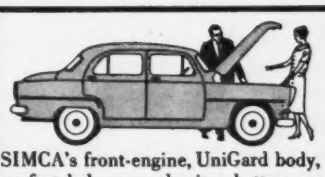

# Should a car's engine be in the front or in the rear?



The weight of SIMCA's front-mounted engine is directly over the wheels



Leverage of "all the way back" engine mounting creates a severe imbalance.



SIMCA's front-engine, UniGard body, perfect balance, make it a better car.

It makes quite a difference. Extra weight in the rear end of a car can cause a dangerous driving characteristic called "oversteer." Cars like this will exaggerate the effects of cross-winds and road slopes. This makes them difficult to control on the open highway. In addition, the rear-engine vehicle requires a special springing system, known as the "high pivot swing axle." Cars using this system are not capable of the best road-holding performance. On fast curves, their rear sections often rise and tilt.

How does SIMCA hold the road? Motor Life magazine said: "It sticks to the turns as if it were on tracks." Speed Age said: "SIMCA's fantastic road-holding ability is second to none."

Drop by your SIMCA showroom this week, and see the whole SIMCA roster: 5-passenger 4-door sedans, sports cars, hardtops, wagons, and roomy 6-passenger cars too. SIMCA prices start at $1698, East and Gulf Coast ports of entry. Inland freight and local taxes are extra.

If you'd like to learn more about the engine placement question, we'd be glad to send you a full report. Why not tear out the coupon now, so you won't forget about it?

**SIMCA** IMPORTED FROM PARIS BY CHRYSLER

SALES, PARTS, AND SERVICE THROUGHOUT THE U. S. A. AND CANADA • OVERSEAS DELIVERY, TOO!

Chrysler Corporation
P. O. Box 1919, Detroit 31, Michigan

*Gentlemen:*

*Send me a copy of SIMCA's new booklet, "The Advantages of Front-Engine Cars Over Rear-Engine Cars."*

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

3CI-859


A 2.4 litre Jaguar is forced into front-end breakaway in a Dunlop Proving Ground cornering test.



# letters

### OUR APOLOGIES

When I read the article, "A Comet Called Archie" by Donn Munson in the July issue, I was amazed to see that my birthplace, Paisley, had been moved to England for the occasion of Archie Scott-Brown's birth.

At the time I was born there, it was in Scotland, and when I left Paisley in the Fall of 1927 it was still in Scotland. I do not recall that at any time during that year it was picked up bodily or in pieces and moved to England. I was attending school in Paisley during the month in which Scott-Brown came into this world, and I hardly think such a "moving" event would have passed unnoticed.

Since all Scotsmen are exceedingly proud of their heritage, Archie Scott-Brown would probably turn over in his grave if he knew that your author had accused him of being born in England of all places and then had added insult to injury by referring to him, later in the article, as ". . . the little Englishman".

Yours painfully,
W. G. H. Adam
Burbank, California

**Apologies to all loyal Scotsmen. The goof was ours. Paisley is hereby editorially returned to its native and rightful heath.**

### A FEW ERRORS

I've just bought my first issue of SCI and I find it full of interest and refreshingly free from over-advertising.

However, glancing through the July issue, I noticed several errors. Having misspelled Hawthorn's name a few times you then spelled "rallies" as the French do.

Archie Scott-Brown, for whom I had great admiration, was killed when his Lister Jaguar left the track during a sports car race at Spa, certainly not in a GP race. Lastly, Aston Martin never have had a hyphen in their name, and don't let a Scotsman hear you say that Paisley is in England!

Michael G. Matthews
Montreal, Quebec

### FORMULA JUNIOR

I was very much interested in your feelings on the Junior Formula expressed in your editorial (July).

Having been the first American to participate in a Junior Formula race, Naples 1958, I would like to see more interest in this type of racing.

Many of the articles on these cars seem to treat them as a sort of toy, or big F-III . . . when they are really 100% racing cars capable of high speeds.

I'm returning to the continent next year a little better equipped and you can be sure a Junior Formula car will be included in the list of musts.

George L. Smith
Miami, Florida

**Editor's Note: It would seem that we've really stirred something up with this Formula Junior business. The following letter is printed in its entirety because we feel the writer has some-**

**thing to say that will be of value to any and all readers interested in Formula racing of all types. Any and all further correspondence will be welcome on this subject.**

Since the FIA announcement of the New Formula Junior was released your competing magazine has seen fit to publish several articles on the subject. In each such instance their writers (notably Mr. Gordon Jennings) have seized upon the opportunity to deal a not inconsiderable backhand to Formula III racing. Now in your current issue you have implied that F III racing has had it with the advent of the new formula.

Please bear with a few opinions. Within my personal experience I honestly believe that F III has been the least publicized of all areas of motor sport (up to and including "how to run a Scottish autocross"). When the 500cc cars show up at the grid the audience will be seen taking its fifth inning stretch, going to the john and picking up beer and eats. The announcer will generally make some sarcastic comments about the four wheeled motorcycles and then commence to advertise the big stock car bash that will take place on the track next week. I am of the firm belief that the responsibility for these passive attitudes rests largely with the very magazines that elected to further the interests of all motor sport.

Your suggestion that a new front running F III machine would cost in excess of three grand is absolutely correct. But consider for a moment—there is really no such thing as a new F III car. Even Cooper installs second-hand engines (JAP or Norton) in their offerings. By Cooper's own admission, there has not been a significant change in the design of their cars since the Mark 9. Actually the motivating factor in the selection of any Cooper chassis from the Mark 5 through the Mark 13 is probably the size of the driver. Certain chassis would accommodate a pretty big man—others would not. A couple of months ago the F III event at Marlboro's Presidents Cup race was won by Bob Kahmer driving a Mark 5 Cooper with a Triumph twin engine installed. If anyone would like to buy this front-running machine, $2200 will get him the car, $300 worth of spares (head, magneto, carbs, etc.), a $350 custom built aluminum trailer and a '53 Ford Ranch Wagon tow car. This price is fairly representative for used equipment in the F III category.

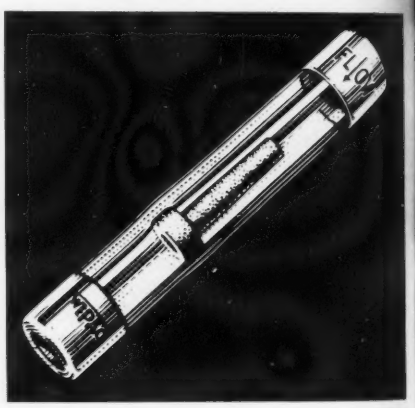
Let's take another approach. The formula machine is strictly a racing car. There is no pretext here of a dual purpose machine. Audience identification with formula cars will always fall short of sport cars. Now if the idea behind promoting formula junior at the expense of F III is to have the jr. cars replace the F III cars in Sport Car races as a change of pace event, I don't think you will have gained anything. Under these circumstances the Jr. cars will come to enjoy the same indifference that the F III cars now labor under. If on the other hand, one thinks in terms of promoting Formula races, what would be more logical than having all Formulas represented? I quite appreciate that there are many courses where F I cars could not turn as good lap

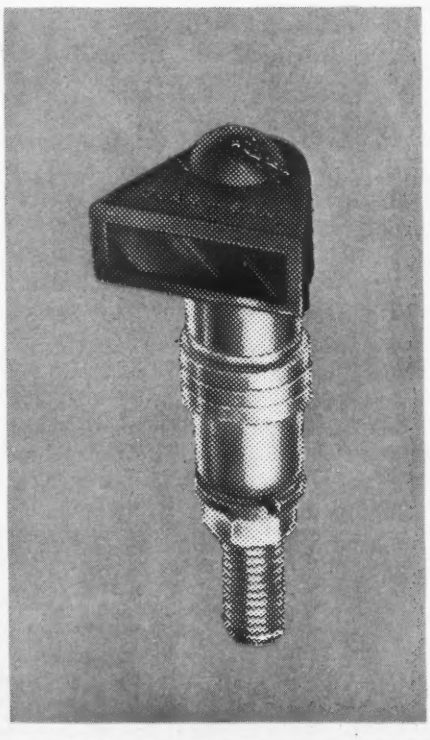
*(Continued on page 14)*

# new products


The Goodyear Tire & Rubber Company has developed a new sports car racing tire known as the "Grand Prix". Designed to withstand sustained speeds of 140 mph, and short bursts to 160 mph, the tire is available in 5.50/5.90-15, 6.50/6.70-15, 5.50-16, 6.00-16, 6.50/6.70-16 and 7.00-16 sizes. The two largest sizes are of six-ply construction, the others of four-ply.

A compact filter in the form of a fuel pipe coupling takes up little room and allows visual inspection of fuel flow. The filter element is made of sintered bronze to insure filtration of the most minute particles. The entire unit is flexible and absorbs shock and movement to help prevent fatigue that might occur in metal fuel lines. Available at $1.50 each from Vilem B. Haan, Inc., 10305-07 Santa Monica Blvd., West Los Angeles 25, California.





Non-glare lighting for all night driving conditions is available through the use of prismatic lighting units. Called "Bolt-lite", the unit is easily attached to the dashboard by drilling one hole, and precisely lights only that area where it is needed without spilling extraneous light that might blind the driver. Available for six or twelve volt systems from Glar-Ban Corporation, Box 34-I, Station B, Buffalo 7, N. Y.


The couple on the left doesn't know a badge bar from a bumper... doesn't even care. Yet they're having the time of their lives in their Triumph TR-3.

The power that can take this car up to 110 makes it more satisfying to drive at 50. Or 25.

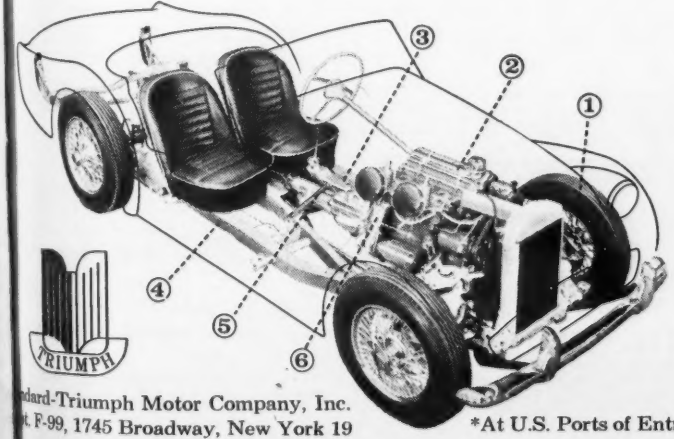
The performance that has brought the TR-3 home "1st in class" in practically every important European rally brings you home from the station or shopping with a genuine lift of spirits.

Fun is standard equipment on a TR-3. So is ease of handling. So is comfort. (The seats, designed to reduce the gruelling strain of rally driving, "sit" better than many an easy chair.)

And don't forget economy. A TR-3 delivers up to 35 mpg... costs $500 less than any comparable car.

There are now over 700 Triumph dealers. One lives near you. He'll hand you the ignition key any time you want to take a drive. Why wait?

**TRIUMPH TR-3**
**ONLY $2675***




**Six reasons why the TR-3 is your best sports car buy:**

1. *DISC BRAKES:* Standard equipment on front wheels for maximum braking efficiency.
2. *1991 cc. ENGINE:* 100 horsepower; top speed: 110 miles per hour; acceleration: 0-50 in 8 seconds.
3. *GEARBOX:* 4-speed; short throw; synchromesh in 2nd, 3rd and top.
4. *FRAME:* Rigid "X" type for stability; rust-proofed Sheffield steel.
5. *HAND BRAKE:* Racing type; quick "throw-off" action.
6. *RACING CLUTCH:* Heavy duty; woven lining to insure longer life.

*OPTIONAL EXTRAS:* Overdrive, hard top, rear seat, wire wheels, white walls and others (ask your dealer).

*SERVICE:* Dealers in every state—over 700 in all—with service and parts.

dard-Triumph Motor Company, Inc.
t. F-99, 1745 Broadway, New York 19

*At U.S. Ports of Entry, plus state and/or local taxes—slightly higher West Coast.

# letters

times as F III cars. That notwithstanding—wouldn't you like to see a race meet of F I, F II, F Jr. and F III cars?

My point is this—I don't think that those of us who are enthusiasts (and more important—those of you who derive your livelihood from the sport) can afford to knock one aspect of the game at the expense of promoting another. By all means let's promote Formula Junior racing. But please, let's take the broad view and try to advance the cause of all formula racing.

I can't help but believe that a continuation of the current trend of articles on Formula Junior coupled with similar articles on F III and F II would stimulate an interest in special building unlike anything that this country has ever seen. With all due consideration for the general upheaval in sports car circles I think that within the framework of Formula Junior we have a real opportunity for the American special to take its rightful place in the limelight.

In the meantime here's a couple of more items that might be of interest. Should any of your readers make inquiry into Formula III activity, please have them contact me. At the moment I am developing a technical file on the subject for the "Ecurie 500". If anyone has a specific problem and if the solution is anywhere in the files—they're welcome to the info.

William H. McMichael
Kensington, Maryland

SPORTS CARS ILLUSTRATED is a fine informative magazine. You print just enough controversial material to make your readers think. This is a good situation.

The controversial matter which needs my two cents worth is the July editorial. In comparing Formula 3 with Formula Junior you state that "the new formula is more like it". This suggests that there is a choice to be made between Formula 3 and Formula Junior or that Formula Junior replaces Formula 3. Neither is the case. We, of the 500cc Club of America, represent both classes. We think that there is a big future for both classes ahead. In the next two or three years American road race drivers will recognize the advantages of single-seater racing. Why drive a "thinly disguised Grand Prix car" when one can go all the way and drive a Grand Prix car.

Formula Junior is obviously the "economy formula". But in order to be truly economical it must be restrictive. There comes a time in every aspiring racer's life when he wants a machine which is extremely light and highly tuned, but still within his private financial reach. He may even want to build his own design. At this point he finds that Formula 3 fills his need.

Our board of directors have just finalized the American deviations to International Formula Junior.

A comment on the prices quoted in your editorial: The Formula 3 car which has

been unbeatable on the West Coast for the past two years was bought used from Cooper for $1050.

Mark J. Brunner
500c.c. Club of America
Burbank, California

**It was not our intention to suggest that Formula III racing be dropped in favor of Formula Junior. There is most assuredly room for both. What we *did* say was that a good proportion of those who might at an earlier time have become interested in Formula III but who have been held back by the problems inherent in using a motorcycle engine may well become interested in the more familiar form that the new Formula takes. This could well be to the detriment of the growth of Formula III. The engineering of the F-Jr. car is of a far more classic type than is that of the F-III machine and so more familiar to more people. The major parts are also in much more plentiful supply due to the tremendous influx in recent years of the light car. For these reasons and these alone, we feel that F-Jr. will be considerably more popular in this country than was F-III, a fact already borne out in Europe.**

### PAT. PEND.?

Your humorous advertisement in the July issue, the VW "Whang-O", which leaves monstermobiles with a lasting impression after contact with a VW bumper, prompts me to write you of my more silent, but equally effective, solution to the problem of coercing the power-steerer into exercising a bit more care when parking in front of or behind a VW.

For the VW owner, or the owner of any other car with thin-skinned bumpers, this is the approach. Simply take a discarded plastic "squeeze bottle" of sufficient volume and attach a length of flexible hose. Fill the container with a 5% solution of hydrochloric acid and attach the whole thing to the bumper with elastic bands. Direct the hose upward, supporting it with a stiff wire on the inside, and adjust the nozzle to the level of the aggressor's grille or hood. You can see what will happen now when an offender nudges your bumper.

You may use luminous paint, paint remover, or other liquids, depending on your degree of antagonism. HCl is less noticeable and more difficult for the power-steerer to smudge from his car back to yours.

Michael Lamm
New York, N. Y.

# newsletter from Europe

► The timing at World Championship sports and Formula One races is long overdue for revision. The lack of confidence in the timing procedures at European race meetings is becoming so pronounced that even the drivers depend solely upon their team managers for lap times in practice. At the recent 1000 kilometer sports car race held at the Nürburgring, Wolfgang Von Trips was credited with a sensationally fast training time of 9 minutes 40.5 seconds, done in a 1600 Porsche RSK. Even Trips himself did not believe the clocks and felt that even if he did, he could never go that fast again. The official scorers did not agree with the Porsche team manager's times. There were other mistakes made as well, some even more ridiculous. The answer is, of course, eliminate the human element in the timing box. There are too many cars on the circuit, driven very often by more than one driver so that a timer cannot always tell who is driving a particular car in training. Times are given only to the numbers painted on the car, and attributed to the driver assigned that number in the official program. Very often a third driver will take another man's car out in practice and proceed to turn a quick lap.

The Dutch are great ones for fouling up not only training times but also times in the race itself. For instance in the 1959 Dutch GP, the results at the end of the race credited ftd to three drivers, each having equalled the other's times. This, of course posed a problem for the organizers, and so several hours later at the victory banquet, the manager of the circuit announced that fortunately, "there had been a mistake on the part of the timekeepers and that Stirling Moss had actually made ftd." These kind of things tend to destroy confidence in the procedures used at World Championship races. It's high time that the FIA ordered a study of timing methods with a view to using lights or hiring Otto Crocker to put the European clubs on the right path. Some tracks, like Monza and Le Mans, already utilize electronic timers; it's time the rest followed suit, for the day of the hour glass and the trembling hand has passed.

There's a terrific amount of grumbling going on among drivers and team managers as well as in the press about the fact that the 1959 German Grand Prix will be held at Berlin's Avus track this year. The 5.1 mile circuit comprises both sides of a two lane highway joined at either end by banked curves, and although it may be a spectacular circuit from the spectator's point of view, it does not compare to the Nürburgring when it comes to being a challenging road circuit. Travel to Berlin for the various teams with their race cars will not be without complications, and it may even mean flying the machinery in. If this is the only way, we doubt if Ferrari or the English teams will bother coming. Streamlining has been outlawed to avoid expensive special mods so the organizers have taken away the only interesting technical point on a race at Avus. As Tony Brooks said recently, "the two most interesting and challenging Grand Prix circuits available have both been either cancelled or by-passed this year; I was looking forward to Formula One racing at Spa and at Nürburgring in 1959." Financial considerations and internal political factors have undoubtedly affected both events. The RAC of Belgium loses huge amounts of money annually on the Francorchamps Grand Prix, and finds the staging of sports or GT even much more favorable from the financial standpoint. At the recent 1000 km Nürburgring sports car race there were over 200,000 spectators on hand; it will be interesting to see how many Berliners come to the Avus race — undoubtedly there'll be some "schnooping" in the pits from East Zone spies!

The regulations for the 1959 "Tour Auto" — the automobile race around France . . . have appeared and there's considerable talk among rally men as well as top grade sports and Formula One pilots as to the possibilities of this particular competition. If the DB-4 Aston-Martin fitted with a 3-liter sports car engine at Le Mans this year proves successful, there's a good chance that Stirling Moss will be behind the wheel of one in the '59 Tour. Jean Behra threatens to have a Ferrari 250 Europa in his hands as does Olivier Gendebien accompanied by his good friend, mechanic-driver Lucien Bianchi. The 1959 Tour is putting greater emphasis on sheer speed than ever before and the total distance of 3446 miles includes 710 race miles on such French circuits as Monthlery, Rouen-les-Essarts, and Le Mans. There are also four hill climb tests totaling 36 miles. Biggest attraction is the huge prize money involved: 25 million French Francs, ($50,000)! Dates: from the 18th to the 25th of September, starting at Nice.

Further addition to the 1959 Formula One calendar may be the Pescara Grand Prix to be held in mid-August, and don't forget the German International Automobile Show to be held in Frankfurt from September 17th to the 27th.



Prototype Sunbeam Alpine was photographed while under test on the Continent. Lower left: BMW 700 is first effort of old-line German firm into post-war small-car market.

After a 102-mph chase SCI's undercover man in Europe brought an interesting prototype to ground recently. It proved to be the new, and long talked about, Sunbeam Alpine. Even though it was mud-streaked from a long Continental test run the new car's low, modern shape marked it as something unusual in the way of motors. The test car had a removeable hardtop, which will probably be offered as an option, while behind the two bucket seats there was ample room for occasional passengers or luggage. In addition there is a large trunk in the tail. Front suspension is independent with coil springs and tubular shocks, all tied together by a high-mounted anti-roll bar. The rear wheels are tendered to by a solid axle, and leaf springs. Retardation is handled by discs on the front wheels, and drums on the rear

*(Continued on page 20)*


all it shares with other cars is the road / PORSCHE

*Dealers from coast to coast in U.S. and Canada. Porsche of America Corporation, 527 Madison Avenue, New York 22, New York*

# pipeline

You can forget about trying to cop an international record with your Kart. While it might have been possible for a really progressive putt-putt a month ago, it isn't likely now. Seems an Italian named Luigi Cavanna took a highly streamlined "thingie" out on the Autostrada Del Sol and clocked a flying mile at 144.237 and a standing kilometer at 78.74 mph and a standing mile at 91.09. The machine, called the "Flying Silverfish" (ugh!) was powered by a 250 cc Guzzi.

As of the end of June, this didn't seem to be Stirling Moss's year in the World Championship standings. Or any other top-seeded handler's year either. Dark horse Jack Brabham led the field with 15 points, followed by Jo Bonnier with 8. Tony Brooks had 6. Trintignant and Gregory trailed with 4 points each, followed by Phil Hill and Innes Ireland with 3 each. Jean Behra and Bruce McLaren had 2 points apiece. Poor Stirling was anchor man with 1 point, gained for fastest time at Monaco. It could well be that by the time this sees print Stirling will have opted for a seat in a BRM, which he previously turned down as unreliable, an opinion somewhat doused by the fact that Bonnier's 8 points were gained in the BRM at Zandvoort.

# coming events

| | |
|---|---|
| August 8-9<br>New York Region<br>SCCA Race | Montgomery, N.Y. |
| August 8-9<br>New England Region,<br>Fairfield Gymkhana | |
| August 8-9<br>Chicago Region<br>SCCA Race | Wilmot |
| August 9<br>Southern Illinois Region<br>Somnambulist's<br>Delight Rally | |
| August 10<br>Land O' Lakes Region<br>Arrowhead Rally | |
| August 8-9<br>USAC Sports Car Race | Virginia Int'l. Raceway |
| August 9<br>F III, Sports,<br>Touring Car Races | Karlskoga, Sweden |
| August 9<br>Trapani-Monterice<br>Hillclimb | Italy |
| August 14-16<br>Thousand Lakes Rally | Finland |
| August 15<br>Gaisberg Hillclimb | Austria |
| August 15<br>Grand Prix de Pescara | Italy |
| August 15-16<br>F III and Sports Cars | Roskildering, Denmark |

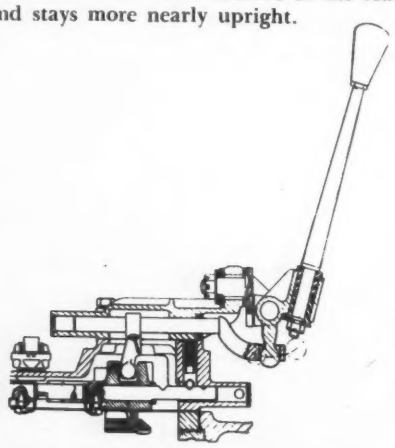
| | |
|---|---|
| August 15-16<br>New York Region,<br>Mt. Equinox Hillclimb | Vermont |
| August 15-16<br>Northeast Mich. Region<br>Overnight Cardinal Rally | |
| August 21<br>Chicago Region,<br>Night Rally | |
| August 21-23<br>New England Region<br>Berkshire Mt.<br>National Rally | |
| August 22-23<br>So. Jersey Region, Race | Vineland, N.J. |
| August 23<br>Grand Prix of Portugal | Portugal |
| August 23<br>Urey Hillclimb | France |
| August 29-30<br>New England Region<br>Drivers School | Thompson,<br>Conn. |
| August 29-30<br>Wash. Region, Race | Marlboro, Md. |
| August 30<br>USAC Sports Car Race | Limerock, Conn. |
| August 29<br>F II and Sports Cars | Brands Hatch,<br>England |
| August 29-30<br>International Grand<br>Championship Hillclimb | Switzerland |
| August 30<br>F Junior and Sports Cars | Chieti, Italy |
| August 30<br>Aoste-St. Bernard<br>Hillclimb | Italy |
| Sept. 2-6<br>Liege-Rome-Liege Rally | Belgium |
| Sept. 5-7<br>New England Region<br>National Race | Thompson,<br>Conn. |
| Sept. 5-6<br>Alabama Region, Race | Courtland<br>Air Base |
| Sept. 5-6<br>Charleston Region, Rally | |
| Sept. 7<br>Land O' Lakes Region,<br>Gymkhana | |
| Sept. 5-6<br>USAC Sports Car Race | Meadowdale, Ill. |
| Sept. 5-6<br>CSCC Sports Car Races | Santa Barbara,<br>Cal. |
| Sept. 5<br>Tourist Trophy | Goodwood,<br>England |
| Sept. 6<br>F Junior and Sports Cars | Salerno, Italy |


"There's a guy to see you. Wants to buy ad space on your belly pan."

# technotes

## JAGUAR 3.4

Quietly in Coventry and without fanfare, improvements on the Jaguar line are accomplished. Below is a sectional view of remote control shift linkage which has been fitted to all 2.4 and 3.4 models for quite some time now. The shift lever is now about five inches further to the rear and stays more nearly upright.

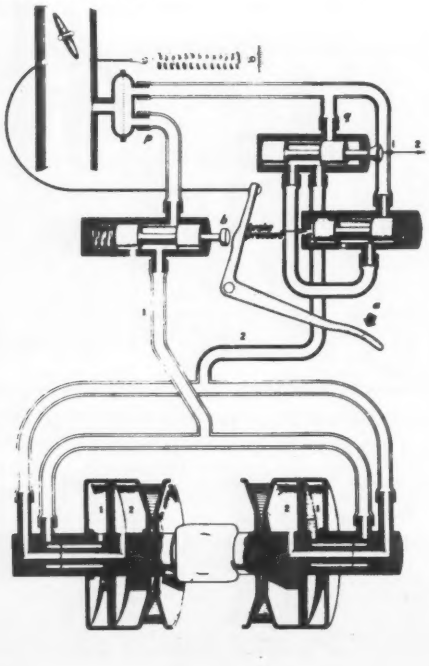


## METALLIC BRAKES — SINTERED

Corvette owners may now fit the impressively efficient Moraine metallic brakes to existing cars by ordering Part No. 3759940. This conversion kit includes new shoes, drums and heat-resistant pull-off springs a well as instructions and the linings themselves. Adjustment: Back off 12 notches from light uniform drag. Seat in with six moderately fast stops from 30 mph followed immediately with six or more stops in rapid succession from 60 or more mph — using heavy pedal pressure.

## DAF NOTES

As anyone realized when he tried to read the specs in the DAF Road Test, we were a little short of space. Below is a schematic showing the control system for the Variomatic transmission described on page 89 of the July issue. The Chinese were right, one picture is easily worth a thousand words.



## *European Newsletter*

*(Continued from page 16)*

ones. The test car was fitted with wire wheels sporting three-eared knock-off hubs. A four-speed gearbox—with overdrive—is driven by the 1.5 liter four-cylinder engine as used in the older Rapier model. Our man couldn't pry any horsepower figures out of the test crew, but examination of the red-lined tach would seem to indicate that the power plant peaks at about 6000 rpm. To sum up: the car looks very attractive, is well finished and appears to be very stable when chased at speed by eager auto journalists.

Another new car that made its debut under more formal circumstances recently, was the B.M.W. 700 sports coupe. Auto writers from all over Europe were invited to Starrenberger near Munich to see and sample the newest product of the Bayerische Motoren Werke. The B.M.W. firm has been under fire from the local press of late for being one of the few car companies not helping to boost the profit index of the soaring German economy.

Some critics seemed to think that the announcement of the 700 was premature —done to divert attention from the company's financial condition. Politics aside the newcomer seems to be an intelligent — if not brilliant — use of existing components all wrapped up in a pretty Italian-styled body. Its twin-cylinder air-cooled engine—actually the power plant used in the 600 sedan with bore and stroke enlarged to increase the capacity by 100 cc —produces 30 hp at 5000 rpm. This is some 50-percent more power than the original 600 engine developed. The independent front and rear suspensions are practically the same as those used on the older 600 sedan. Some of the components, however, are a little heavier to cope with the higher speed potential of the coupe. Driving the car is a sheer delight. The B.M.W. people had laid out a short test circuit on the curving mountain roads, which naturally enough, just suited the gear ratios in the 700s all-synchro box.

With 35 S.A.E.-type horsepower propelling 1388 pounds performance figures of 22 mph in first (in just over 3 seconds) 37 mph in second (in just under 9 seconds) and 59 mph in third (in 23 seconds) are easily achieved. In fourth it will run along at just about 80 mph. These acceleration figures are slightly better than those provided by the factory, because we took the car up to the allowable rev limit of 6400 rpm while all official figures were clocked at 5000.

Sheer speed is not what makes the little B.M.W. 700 sports coupe such an appealing car. A well thought out combination of good roadholding, ride and precise steering—plus excellent brakes—make the 700 a delight to "tiger" around back roads. A side note to illustrate the progress of automobile engineering: The B.M.W. test-

The new Lloyd 900.

ers found that the new car has about the same performance as the firm's well known pre-war type 327 2-liter sports coupe.

To date no serious competitor to the aging VW has appeared on the German automotive scene. A car that may turn out to be just that is the recently announced Lloyd 900. Powered by a water-cooled OHV flat four of 897 cc capacity the new Lloyd pokes along at a respectable 7[illegible] mph. Its new short-stroke engine develops 38 honest horsepower at 4800 rpm. It manages to do this on the modest compression ratio of 7.5:1. It sports a very attractive body whose well balanced lines make it seem larger than it really is. Big windows and a roomy interior—plus the styling—all add up to an attractive package. The new Lloyd has front-wheel drive and a four-speed gearbox that is fully synchronised. Front and rear suspension are independent—by wishbones and coil springs up forward and trailing arms in the stern. This latter system has the advantage of eliminating toe-in due to body roll. The double domes at Bremen have not only given serious thought to the suspension of their latest economy car but they have also worked out a new set of brakes. In consequence the Lloyd 900 is the only small sedan equipped with finned brake drums of aluminum bonded to steel liners.

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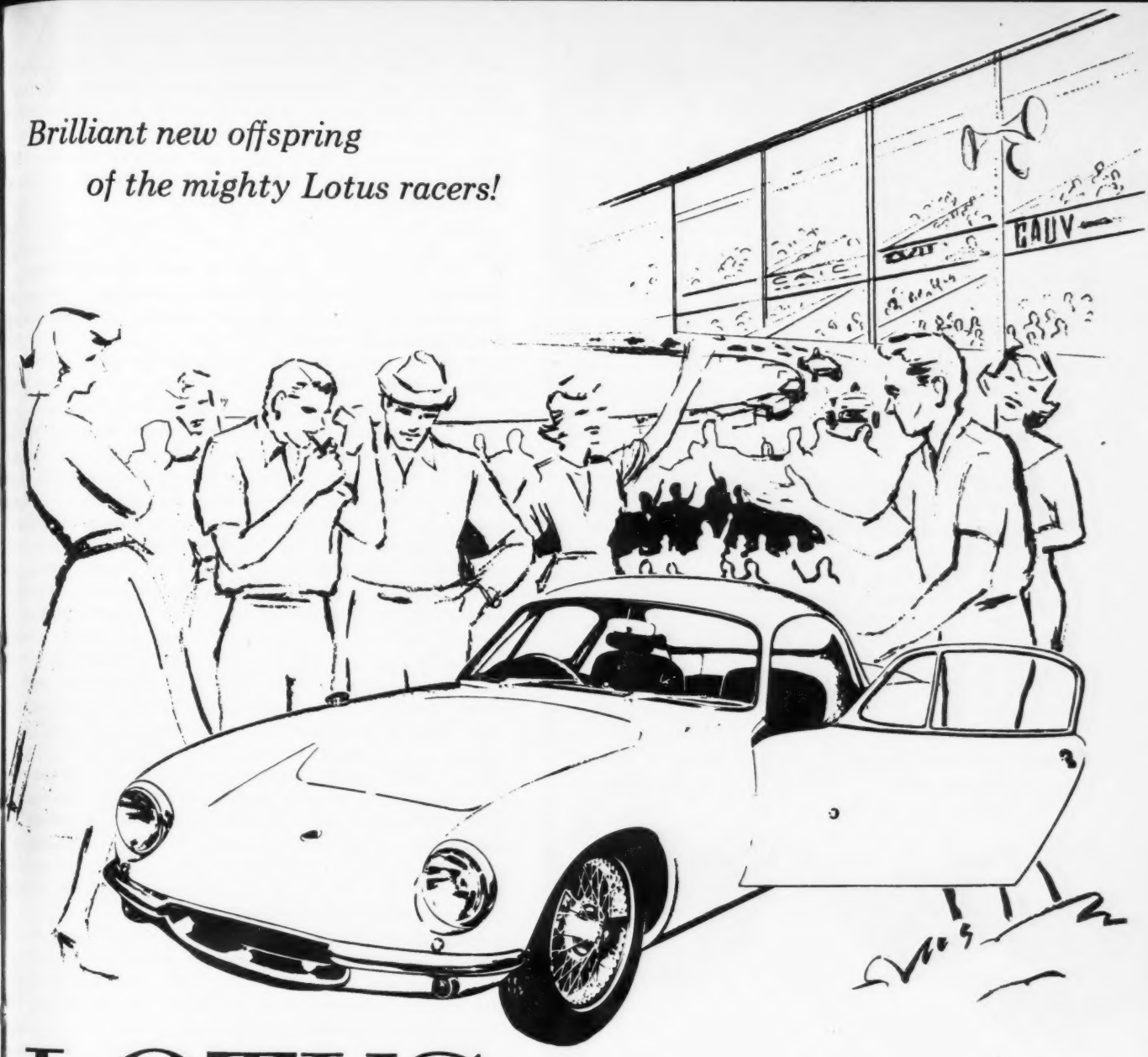

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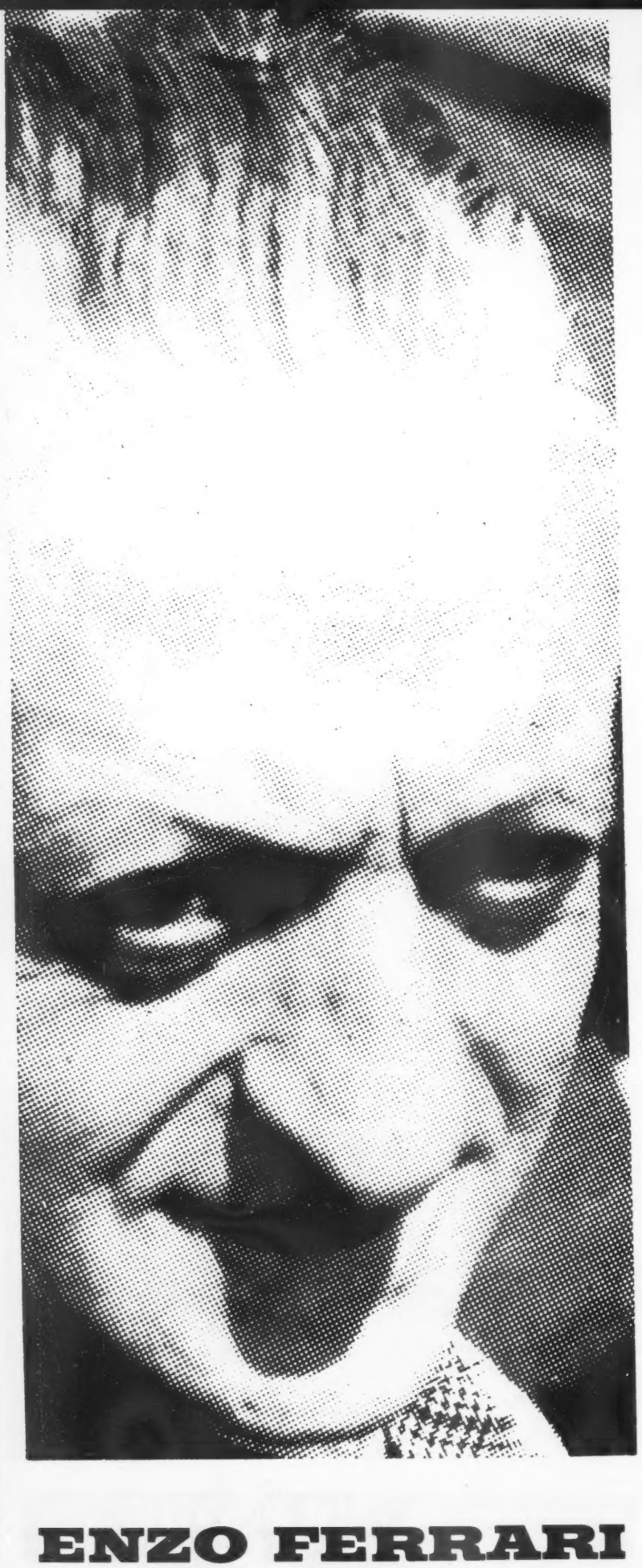


# ENZO FERRARI

*By Steve McNamara*

► Ferrari is a common name in Italy. It adorns countless bars and shoe stores and occupies that thick section in Italian telephone books which in the United States features Brown or Jones. But within the past 20 years the world has come to know Ferrari as the name of an extraordinary Italian whose crest of a black horse rampant on a yellow field adorns the most successful racing cars in history.

Enzo Ferrari's comparatively heavy and incredibly tough cars have been in the public eye since, as Ferrari describes it, "I picked up the torch laid down by Alfa Romeo in 1937." Ferrari himself has remained remote, content to have his laurels shipped to Modena and stepping forward only when pressured to do so.

This insistance on privacy has had predictable results: Admirers and detractors have woven stories around him composed of rumor and hearsay. In real life Ferrari is essentially a plain person of monumental will and dignity who, like his cars, is sturdy and powerful. Assisting the story-tellers is the fact that Ferrari's life is full of paradoxes, of which the most striking is that despite a fervent desire to lead a simple life, he has found himself in constant complications.

The red racing cars of Scuderia Ferrari have won more prize money than any other marque in history, yet Ferrari is not a rich man and the finances of his factory have often been shaky. Ferrari has immense pride and awareness of his high position, yet he has been forced to make a public appeal for support. He dislikes arguments and bickering, yet he is involved in almost constant skirmishing with the Italian government and press, race organizers, suppliers and customers. He is a former driver of considerable skill whose whole being is bound up tightly with his racing cars, yet for business and personal reasons he believes he should never be present when his cars are raced. He speaks earnestly of "equally valuable lessons learned in defeat and victory," yet the pressure to win which surrounds his equipe is almost overpowering. Ferrari is one of the few men to succeed financially by building competition cars, yet he believes himself hounded by disappointment and tragedy.

There is an Italian proverb that runs, "Donne e Motori, Gioie e Dolorie; Women and Engines, Delight and Anguish." One of Ferrari's admirers once said that as far as the engine end is concerned, there is no man to whom this proverb better applies than Enzo Ferrari.

Ferrari's beginnings were in no way extraordinary; no comet creased the sky when he was born 61 years ago in Modena, a farming and light industry center of some 100,000 population situated in Emilia, a flat north-central Italian region which lies within view of the mountains along the western coast of the Gulf of Genoa.

Modena is a pleasant and sunny but unimposing city whose principal non-automotive tourist attractions are a very old church, the Italian military academy, a local wine which tastes much like sparkling burgundy and, since Mussolini, a mammoth swimming pool. Like many Italian cities it is fiercely provincial; when speaking among themselves the Modenese use a language quite remote from Italian and which they insist is the *lingua madre* of all Italy. This prompted one person to defend Ferrari's refusal to learn English by remarking that he already speaks three languages: Italian, French and Modenese.

Enzo Ferrari's father owned a small ironworks in Modena (the name Ferrari is a derivative of the Italian word for iron.) This was bound to result in a predeliction for automobiles since, along with bicycle repair shops, ironworks were hotbeds of early automotive interest. Ferrari says "Henry Ford was the man responsible for the dreams of my youth." Apparently the tinkering and the dreams took up too much time; young Ferrari did not do at all well in technical school.

When Ferrari was 18 his father was killed in World War I. His mother had died earlier and when, shortly after his father's death, Ferrari's older brother died, it meant the

end of the family business. It also meant the beginning of a string of personal sorrows which are a strong reason for Ferrari's desire for a secluded life.

Ferrari moved to Turin and went to work in *Costruzioni Meccaniche Nazionale* (later the Piaggio scooter company) and then followed a long period of only modest progress along the automotive path. Once he got his "break," progress was swift. In 1932 he began racing a modified Alfa and a year later he joined the Alfa factory team. He was a driver of not inconsiderable skill but of modest success. In an era when only the featured few commanded anything like a living wage, Ferrari's wallet was often very lean.

After two years as a team driver he became Alfa's racing manager in 1935. His four-year term was no picnic; Alfa was faced with Germany's silver meteors. Hitler-prodded and state-assisted, Mercedes-Benz and Auto Union were invincible . . . and put out Alfa's torch. Ferrari grew to have little warmth for the Germans, a feeling which later events would increase.

Those four years did have their more rewarding aspects. In addition to his managerial duties Ferrari was named the Alfa agent for Modena and Emilia's adjoining provinces. The money began trickling in and with it Ferrari started repair shops in Modena and on farm property owned by the family 10 miles southeast of Modena and on the outskirts of the village of Maranello.

By 1939 he felt sufficiently well fixed to buy some Alfas and start his own scuderia. As he was to pioneer many aspects of racing team management, Ferrari was the first to form a private team, a concept taken up in the United States on varying scales by Briggs Cunningham, John Edgar, Temple Buell and George Tilp and most successfully in Great Britain by Rob Walker.

It was also in 1939 that Ferrari became a *Commendatore,* a title he wears with great dignity and which is used scrupulously by all his associates when they address him. This puzzles some people because in recent years *Commendatore* has become a not overly-impressive title which its owners usually pack away for formal occasions. The explanation is that Ferrari was the first man who worked with his hands to be so honored and at the time the award was made there were only 125 living *Commendatores.* Ferrari attaches considerably more importance to it than to the nominally more important *Cavaliere del Lavoro* which he was awarded in 1954. In addition, Ferrari's first award was bestowed by King Victor Emanuel III and Ferrari's political sympathies are more with the good old days than with the republic, which on occasion has criticized him so severely.

After establishing his shop in Modena, Ferrari set about making his cars more Ferrari than Alfa. In 1940 the first Ferrari to ever race, an 8-cylinder 1500 cc model, won a closed circuit event near Modena. The driver was Alberto Ascari, the man who in later years was almost as much of an asset to the team as Ferrari himself.

Ferrari and Ascari had time for but a few more races when the war arrived, Racing cars are not a war industry, so Ferrari converted his Modena shop into a machine tool factory. He did quite well and his ledger showed a nice profit until the Americans dropped eight bombs on the plant. In Ferrari's view this was a war risk but what happened next rankled him a great deal. The Germans rolled up to the factory, cleared away some of the rubble, loaded what was left of the machinery on trucks and drove away. He was totally defeated in persistent attempts to exact payment for the machinery from what were supposed to be his allies. Ferrari gathered together what was left in the factory and moved his operations to the repair shop outside Maranello, safer he hoped from both American planes and plundering Germans.

The Maranello factory has been expanded year by year until today, on the inside, it is a quite modern plant employing about 300 men in both the racing and GT divisions. With the exception of the imposing dark red brick front with high fencing and guard, the outside still looks more like a farm than a factory. It is a modest, low, rambling structure plumped down amidst poplar and mulberry trees supporting grape vines. The racing and GT divisions are separated by an informal courtyard which serves as a store place for stacks of metal bars tagged for their intended purposes. The poplar-lined road to Modena is used to test the GT's and drivers try to arrange the higher speed runs around lunchtime or whenever traffic is thin.

Maserati and Stanguellini build cars in Modena and Scaglietti builds bodies, but Ferrari builds nothing whatsoever there. The Modena building serves for the servicing of customers' GT's, the offices of Ferrari Automobili and, atop the offices, the small apartment in which Ferrari and his wife live. There are Ferrari service centers in Rome, Milan and Turin but most Italian customers prefer to bring their cars to Modena.

After the war Ferrari began to rebuild. Through his vast technical experience and, above all, his determination and will power, Ferrari racing cars became more and more respected and feared.

By 1952 Ferrari had reached a position of dominance. Alberto Ascari's years of toil paid off with the first of his two straight world championships. In the next six seasons Ferrari won five sports car titles and Ferrari drivers won the championship three times. The three years a Ferrari driver did not win (1954, '55, '57) Fangio was responsible. In 1956 somebody announced after long study that Ferrari cars had won 503 races in nine years, then he backed down and threw in the towel when it was pointed out that hundreds of small race results, and Ferrari victories, never make the record books. Since then nobody has tried seriously to count Ferrari wins.

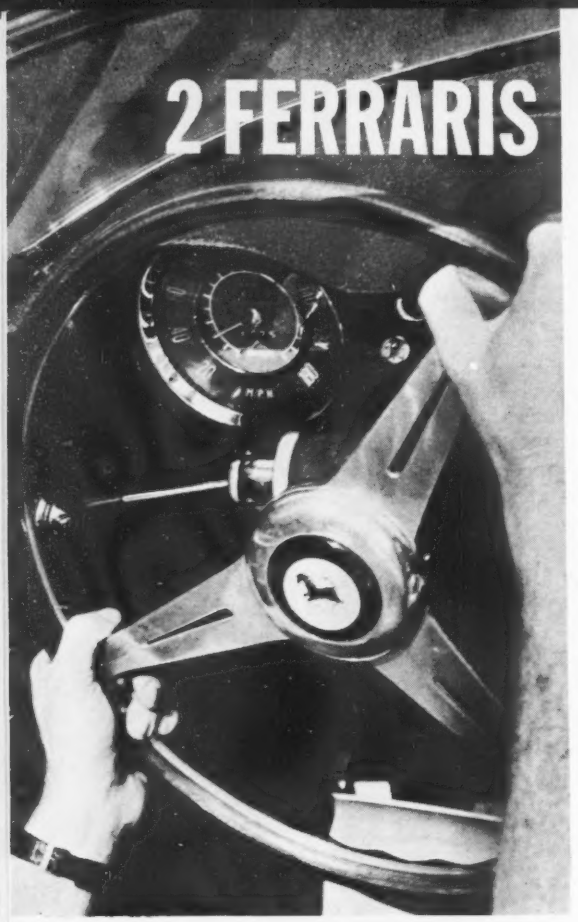
The year 1952 also marked the first of Ferrari's two frustrating encounters with the Indianapolis Motor Speedway. Four cars were sent to Indiana with guarded hopes of victory since, after all, it hadn't been so long since Wilbur Shaw mopped up with a Maserati. It turned out to have been long enough for the construction of Indianapolis cars to have developed into a highly specialized art, quite apart from the construction of Grand Prix or sports cars. Three of the Ferraris failed to qualify and the fourth, driven by Ascari, cracked up early in the race. Ferrari tried again in 1956 with Nino Farina at the wheel and the results were no better. Ferrari was sorely disappointed and not a little humiliated. When questioned each year since about the possibility of entering, he has disclaimed interest. But those who know the Commendatore find it difficult to believe he has written off the Brickyard.

In the 1952 Indianapolis affair there were several sprinkles of disappointment; 1955 was the year of the great deluge. After years of planning, Mercedes-Benz again unleashed its silver cars. With Mercedes able to call on the talents of Fangio and Moss and on its virtually unlimited financial and technical resources, Ferrari found the struggle even more unequal than during his pre-war years with Alfa. Mercedes flashed home first in race after race, and with Stirling Moss aboard set the record which still stands for the Mille Miglia, until then almost a Ferrari fief.

The loss of the Mille Miglia was insignificant compared to the loss of Ascari, killed at Monza testing the car of his protegé, Eugenio Castelotti. Ascari, whose effortless style surpassed even that of Fangio, had been a mainstay of Scuderia Ferrari in lean years and fat. The shock of his death was increased by the almost mystic similarity between its circumstances and those surrounding the test-drive death of his father.

Right on the heels of Ascari's death the Pirelli bomb was dropped. Before and since Ferrari has had squabbles with his suppliers, most notably with the body makers who object

*(Continued on page 76)*




# ROAD TEST 250 CALIFORNIA 250 GT BERLINETTA

► Our first time out in a Ferrari 250 GT we managed to start off in third gear, not having realized that the reversed gearshift pattern has been done away with. Though we stalled it once, we didn't catch on until the traffic permitted some full-throttle work. The resulting acceleration was hardly worthy of the name Ferrari and when we looked at the tach and speedo, we understood why: forty indicated and turning only 2000 rpm!

The reason for telling this little story on ourselves is not to amuse so much as to emphasize how tractable this engine is. We are used to incredible stories of the low-speed tricks one can play with the big eights and twelves of the American Classic period. We were frankly astounded to find we could perform them with a super-short-stroke twelve rated at 1.33 hp per cubic inch in its mildest version. What manner of car is this Gran Turismo that it can be so docile despite its violent Grand Prix lineage?

When a GP builder turns to GT cars, one's automatic assumption that these too will be champions may be a fallacy. After much thought, we think that is the case with the Ferrari 250 Gran Turismos. Tractable engines do not by themselves make tractable cars anymore than wire wheels alone make a sports car.

Briefly, we thought the bodywork, the engine and gearbox were great, and that the handling was good; but that the steering as well as the brakes and seating were awful.

The first three items alone no doubt account for a larger than usual chunk of the car's price, but since twelve grand is so much it seems reasonable to demand perfection in all other departments too. Though this engine's been around for a dozen years, it's only been since 1954 that Ferrari's effort to build cars for road use became serious.

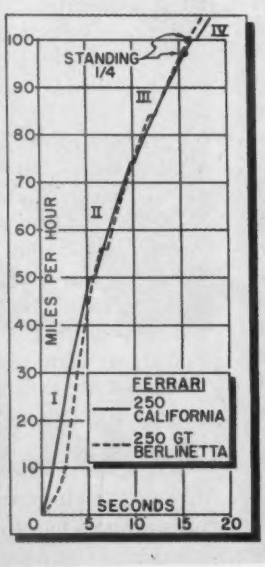
Ferrari now makes four models in the 250 series. Succeeding the Boano-bu coupe tested previously is a Farina-d signed and built notchback coupe, T'bi like in line. It is powered by the 240 version of the three-liter V-12. This is t engine shown in cutaway on page 51 a for convenience we'll refer to it as t coupe engine. This steel-bodied coupe definitely not intended for racing. It a fast car for fast touring; or quite literall a grand touring car in the old traditio

In the new, American tradition is t open version of this car, the 250 Californ roadster. As its name implies, it is intend especially for our climate which, desp the brightly colored travel posters, enjo more top-down weather than most of E rope. Steel bodies for the roadster a built by both Farina and Scaglietti. T test car is by the latter and the only d ference is in the form of the tail lig and neighboring sheet metal of the re fenders. Farina's look just like those on t 4.9 Superfast (SCI, Sept., '58).

Careful readers will notice that for t California, Ferrari spurns the GT ter nology. Just as its manufacturers regard the popular Speedster as a vulgar Porsc for vulgar Americans, so the Califor is looked down upon by both its build and distributors as being "not quite t real thing." Sounds almost British, but i not. Neither is it realistic. Despite cert reservations, the California is certainly t model we'd choose.

To continue the Porsche analogy, "proper" sort of open model is made. each case it's been called both Convertib and Cabriolet. Confusing! In the Ferr line too, we suppose it has a lined t but since it runs a mere $2000 extra, th aren't many around for us to inspect.

While the 250 GT (Farina) Coupe unsuited to racing, being a bit heavy a not so aerodynamic, the California roadst is now one of the very few cars lis by the SCCA as Production that can




driven to the race, taped and numbered, raced and then driven home with a trophy in the trunk — all this without going through a lengthy preparation-for-competition rebuild. Of course, when the competition gets stiffer, perhaps some under-the-hood work will be necessary, but from here, Ferrari Automobili seem to do a singularly fine job on the engine above all other components.

Whenever someone thinks up a category for car racing designed to reduce the cost or broaden the appeal, someone else eventually thinks up a loophole to sneak through. Today's competition sports cars are no more suitable for shopping trips than a Caterpillar tractor. The FIA's Grand Turismo category is in danger of moving the same way, for Ferrari, ever able to sniff out the possibility of a first-place trophy, came up with his third 250 GT model, the *Berlinetta*. The FIA allows it in the Gran Turismo events, but the SCCA in Westport is much more rigid despite some eloquent remarks from George Arents, owner of the Berlinetta sampled. It is an aluminum-bodied (Scaglietti) closed two-seater designed expressly for racing in GT or Production Sports Car events.

These then are the three Ferraris currently and readily available (for $12,000 apiece): the Coupe, the California and the Berlinetta. We were able to try the coupe for only a short run as there was no generous owner around to lend it to us for any length of time. Briefly, it is luxuriously appointed with seats for two (three, if someone wants to try the driveshaft tunnel) and sufficient trunk room for luggage to fill a station wagon (pre-war Fiat, that is).

We did get to test two of the 250 Ferraris, though, a California belonging to young Harvey Schur of Scarsdale, N. Y. and the much-raced GT Berlinetta of George Arents of New York and Miami. Ah, the joy of actually driving a Ferrari. All one's pent up ambitions released at once. We don't know what it's like when you've bought one, but when it's lent on a no-holds-barred basis, it certainly brings out the exhibitionist in us. Passers-by varied in their remarks:

"Oh, sure, that's a twelve cylinder Ferrari."

"I don't know what it is, but it's *beautiful*."

"Hey, is that a 300SL?"

In the first two cases, we soaked up reflected glory as if we were the Commendatore himself plus Pinin Farina and the top ten Grand Prix drivers all wrapped up in one package. Ah, bliss.

In the latter case, we looked disdainfully at the occupants of the violet custom Chev (with plugged lakes pipes, yet) yelled, "No, it's a Ferrari," and roared away in the lowest usable gear into a handy tunnel. After shaking its walls with our (we hoped) reverberating exhaust, we dawdled along, waiting for them to reappear alongside but they never did. Visiting some friendly trolls, perhaps. We drove on, wondering about our behaviour.

This sort of emotional content is much sought after by manufacturers the world over, whether they make cars or toasters. Of it, the Ferrari has more currently than any other car. But emotions aside, what else do these cars have to offer?

For one thing, the California and the Berlinetta have the most beautiful bodies this side of the Riviera. We don't know how or why, but the Italians seem to have a nearly exclusive distributorship on auto beauty. As well as the overall shape, some of the details reflect originality too (though American pull-up door handles barely beat the Farina coupes' to the market place). Other details serve to remind us that the Italian designers don't seem to get clued in promptly on the few interesting devices that Detroit *does* come up with. Dip-mirrors (manual, which is enough) are now standard, so are the stalks on the steering colum which control both turn signals and headlight-beam. The first part is done in the conventional manner, up-right, down-left. The second function is shared with a "pull down, twist and pull down again" knob, one of several controls along the edge of the dashboard. With the knob down all the way, the lever selects either "low-close" or "high-away." Half way down and "away" becomes parking.

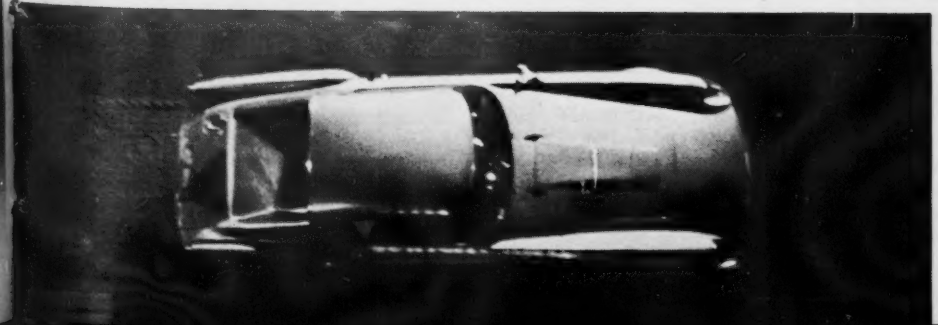
We interrupt our narrative to bring you a special announcement. We finally got a ticket while road-testing. In a Ferrari yet. For what? For doing 125 in a 35? No. Alas, alack. For improper lighting. You guessed it, bumped the lever accidentally when the knob was only half-way down. Much talk, no use.

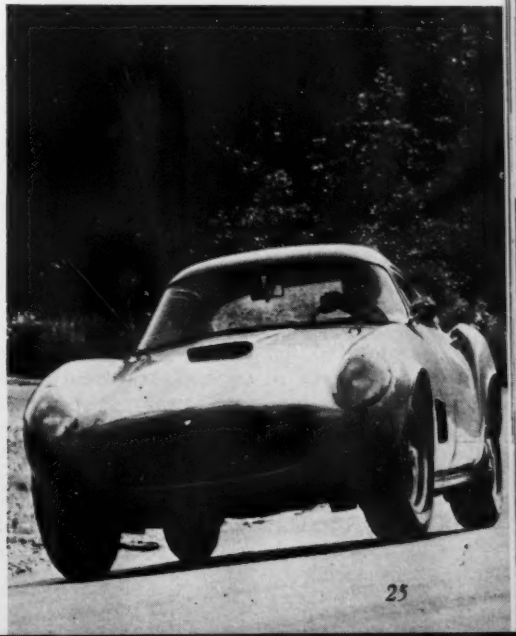
Although the California has roll-up windows, it is called a roadster to distinguish it from the rarer GT Convertible. The California's "rain-rag" canvas top, its windshield, and even its roll-up windows all look strikingly similar to those on the Alfa Romeo Spyder. That Farina makes those bodies too is no more coincidence.

Instrumentation is just what we've been looking for in a sports car; round dials with simple white on black numbering. The ridiculously optimistic speedometer and the tachometer (red-lined at 7000 rpm) share positions of honor before the driver. To the right are four small dials indicating oil pressure and temperature, fuel level and water temperature. Warning lights tell you: lights are on (green), generator's not charging (red), high beam's in use (blue), and electric fuel pump's on (red).

A fifth tell-tale, about dime-size, has a prominent letter T on its red face. One happy owner told us it was the trouble light. "When it lights up, you've got trouble." When we drove the California through Manhattan's mid-town, mid-day traffic on a 90-plus degree day to take pictures, we finally found out what kind of trouble. It lights up when the water temp gets above 190° F., which isn't really too bad at all. By switching off at long traffic lights, that little aluminum fan (It'll never get you off the ground, Mr.

**For more serious racing and less comfy touring, the GT Berlinetta provides an answer to enthusiast's ennui.**





Sikorsky!) managed to cope, and we never heard that horrid rattling noise that means you better look for faucet or bucket.

The noises we did hear were splendid ones. The loudest was the distant thrashing sound of many small parts working closely with one another; there was only a subdued burble of exhaust. To these add the clarion tone of the Marchal air-horn. Its volume builds up as you hold the button down, so gentle taps can warn pedestrians without frightening them, yet sleepy cattle crossing the road a mile ahead can also be signaled — with effect.

Though the crackle-finished dashboards on the two test cars were laid out a bit differently, both carried the same complement of gauges and switches and didn't reflect in the windshield. One point of criticism that the makers will not be able to understand: In a car as fast as these, it would seem imperative that the dash panels be designed with crash stops and the passenger's face in mind. The simple rolled shape seems perfect until you notice the glove box which stiffens the dashboard just where it should be most flexible—right in front of the potential victim. On the California, it didn't even have a cover, leaving the abrupt right angle corners staring you in the eye.

The seats were dissimilar both in appearance and in satisfaction. The roadster is fitted with inviting, soft pigskin seats. They look almost like a pair of Marcel Breuer chairs. Unfortunately, "looks good" doesn't equal "works good" It's not even a simple matter of lack of side support. They just don't support anything at all. Well, hardly.

It's not really the seat's fault. It's the cockpit layout. These cars are designed by Italians, for Italians and around Italians. And Italians don't eat Wheatena for breakfast. Our Italian-sized staff member felt very comfortable but us long johns spent all our driving hours shifting from one cheek to the other. One improvement would be to increase the amount of rearward travel available. The other way out (and a necessary step if American six-footers are to be even halfway comfortable) is to lower the floorboards and the pedal cluster. Then the seat cushion would support the thighs as well. Bringing the seat up to meet the legs is out because they already have to be splayed to miss the steering wheel rim as it is. Sound terribly uncomfortable? It is.

Although the floor level is no different in the Berlinetta, the discomfort index is lower, for the sides of the bucket seats in the Arents car do support the thighs, though only sort of diagonally. These seats were pretty dreadful to look at, being "painted" black over a basic pale green that was showing through. Looks notwithstanding, we'd gladly make an even swap, if the California's were ours to trade.

We think the steering wheel should be lowered too, for its rim cuts across the "horizon" of the hood and front fenders. Doing this would aggravate the seating problem, which only accentuates the need for dropping the floor between the frame tubes around the pedals. (Our apologies to readers who aren't anything close to our build. Most cars seem fairly comfortable to us so we can't be *too* peculiarly shaped.)


FERRARI 250 BERLINETTA AND CALIFORNIA



**ACCELERATION:**

| From zero to | Berlinetta secs. | Calif. secs. |
|---|---|---|
| 30 mph | 4.0 | 3.1 |
| 40 mph | 4.8 | 4.2 |
| 50 mph | 5.8 | 5.4 |
| 60 mph | 7.8 | 7.2 |
| 70 mph | 9.3 | 8.9 |
| 80 mph | 11.1 | 11.5 |
| 90 mph | 13.7 | 13.8 |
| 100 mph | 16.1 | 16.4 |
| Standing ¼ mile | 16.1 | 15.6 |
| Speed | 100 mph | 97 mph |

**SPEED RANGES IN GEARS:**
(1000-7000 rpm)

| | Berlinetta | Calif. |
|---|---|---|
| I | 0-56 | 0-50 |
| II | 12-84 | 10-74 |
| III | 16-114 | 14-100 |
| IV | 20-143 | 18-125 |

**SPEEDOMETER CORRECTION:**

| Ind. Speed | Timed Speed Berlinetta | Calif. |
|---|---|---|
| 30 | 24 | 24 |
| 40 | 32 | 32 |
| 50 | 41 | 39 |
| 60 | 51 | 47 |
| 70 | 59 | 56 |
| 80 | 68 | 65 |
| 90 | 96 | 73 |
| 100 | 85 | 80 |

**POWER UNIT:**

Type (250 GT).....Water-cooled, 60° V-12
Valve Operation.....single overhead cams, rockers
Bore & Stroke.....2.874x2.315 in (73x58.8 mm)
Stroke/Bore Ratio.....0.805/1
Displacement..180 cu in (2953 cc)
Compression Ratio. .....9.57/1
Carburetion by.....Three Weber DCL3 twin choke
Max. Power....260bhp @ 7000 rpm
Max. Torque.....195 lbs-ft @ 5000
Idle Speed.....900 rpm

**DRIVE TRAIN:**

| Transmission ratios: | overall Berlinetta | Calif. |
|---|---|---|
| I—2.54 | 10.14 | 11.61 |
| II—1.70 | 6.81 | 7.77 |
| III—1.26 | 5.02 | 5.73 |
| IV—1.00 | 4.00 | 4.57 |

Final drive ratios available 3.67, 3.78, 4.00, 4.25, 4.57, 4.86
Axle torque taken by.....parallel radius rods

**CHASSIS:**

Frame.....welded oval steel tubing
Wheelbase .....102 in
Tread, front and rear..... 53 in
Front Suspension.....Independent, unequal wishbones. coil springs and anti-roll bar
Rear Suspension.....Rigid axle, semi-elliptic leaf springs and pairs of radius rods
Shock absorbers.....Houdaille
Steering type.....Worm and sector
Steering wheel turns L to L.....3
Brakes.....Twin master cylinder, aluminum drums, 2LS front
Brake lining area.....240 sq in
Tire size.....6.00 x 16

**GENERAL:**

| | | |
|---|---|---|
| Length | 173 in | |
| Width | 65 in | |
| Height | 55 in | |
| Curb weight—½ tank of gas (100 lbs) | 2520 | 2720 |
| Weight, as tested | 2840 | 3040 |
| Weight distribution, F/R as tested | 49.3/50.7 | |
| Fuel capacity | 37 U.S. gals. | |

**RATING FACTORS:**

| | Berlinetta | Calif. |
|---|---|---|
| Specific Power Output . . . | 1.44 bhp/cu in | 1.44 |
| Power to Weight Ratio, as tested | 10.9 lbs/hp | 11.7 |
| Piston speed @ 60 mph | 1130 ft/min | 1290 |
| Braking Area, as tested . . . | 136 sq in/ton | 146 |
| Speed @ 1000 rpm in top gear . . . | 20.4 mph | 17.9 |

Perhaps this is a purely subjective criticism, but the relationship of the car's horizon to the roadway is the driver's major visual clue. To distract here even with the simple shape of a wheel rim is unpleasant, especially in very fast cars, and the driver's ability to conduct his cornering suffers as a result.

To get back to the bright side, between the seats sits the stubby gear shift lever. It has a fluted round black plastic knob which fits the hand nicely. The feel of the shift lever in action too is without peer. An initial resistance to movement, then a smooth, easy yet definite slide as it snicks into the next gear. Despite the extra lightness between gears, there is no free play laterally, so the entire motion feels superbly precise. It's a joy to shift, especially since all four speeds have Porsche-type synchromesh.

The California tested is used only in drag races, the owner being under age for road racing. This specialized sport demands a lot from the cars, but we were still horrified by the brutal technique demonstrated during the acceleration runs. In less than 5000 miles, the second gear synchro was noticeably worn, but then he rarely loses.

Mr. Schur was quite disappointed in the results of our timed runs, pointing out that he had bettered 14.0 seconds in the quarter-mile frequently. Well, we timed what we got. There were two in the car which adds 150 pounds, and we had been expecting something better since we had been told that his car was fitted with the Berlinetta's 260 hp engine. (This is the figure quoted at Luigi's, seven less than for the three quad version.)

For road cars, the clutches seemed touchy, but the ability to conquer this problem requires finesse, enabling the proud owner to show just how good he is.

In the Arents Berlinetta, we made (only once) the mistake of revving the engine for the start, dropping the clutch home abruptly. It wouldn't bite until we eased off. Many honorable racing miles excuse this.

We have mentioned the V-12's tractability before. Hand in hand with this term goes the word reliability. Given decent treatment, this engine should last very long indeed. The fabled plug changes of early models are now a thing of the past, and it is no longer necessary to carry twelve spare spark plugs, ready to be changed as soon as the city limits are reached.

Lots of production engines are modified extensively, ending up as racing car power plants. We even have today's Formula Junior dedicated to this very concept. How rare and refreshing then to find this ex-racing engine turned into a sweet-tempered, responsive engine for touring. All this and four horses for every three cubic inches.

Response to the exhilerator pedal is always smooth even at such low revs as 1000 rpm in top gear. The exception to this is if you mash it violently. With six little accelerator pumps sloshing in fuel, it's not surprising it then stutters.

When depressed less brusquely, the amount of urge seems directly related to how far you've pushed. At low revs, though, this is only true up to so much throttle opening, say one-half at 2000 revs. Beyond that point, further depression gives no noticeable effect whatsoever; neither a change in torque for better or worse nor any stuttering or missing. It's as if the throttle linkage had a tachometer-controlled override which prohibited too much throttle for the existing revs.

Tractable, yes, but there's ample torque there too, even at these subdued revs. Our test program had led us to Lime Rock Park, naturally, and in making a few laps of the mile and one-half circuit, we were so impressed by this low-speed pulling ability that just for fun and without dropping off our passenger, we tried laps in fourth gear alone and in third gear alone. Times were 1:16 and 1:15½ respectively. Of course, we can't declare that we were trying equally hard on both runs, but we were convinced aplenty that there was no shortage of low-speed torque. This run was in the Berlinetta, incidentally, which has the wild cam in it.

Later, on a solo trip, using second and third gears and a 7000 rev limit, we got within a hair's breadth of 1:12, but we were fighting it all the way (and scared silly, too).

It may be only a psychological effect, but with the passenger out, the Berlinetta seemed to have become more responsive and even twitchy, demanding much more than before of the pilot. Even the throttle response seemed stepped up.

The roadster, on the other hand, has a more touring suspension. We looked under the car and it appears the same, but the ride over bumps is gentler though still firm enought to remind you this is a real sports car and no kidding, and there is quite a bit more roll in the same corners. With less roll stiffness, the California requires noticeably more steering lock under the same conditions as the Berlinetta. With its steering ratio effectively lowered it is also less twitchy; in fact, it isn't twitchy at all, holding its line at its admittedly lower limit of adhesion with ease. Though it won't get around corners as fast as the competition hard-top, it is much easier to handle, especially on the open road. The Berlinetta is set up for racing, and no matter how well camouflaged their bodies nor how docile their engines, racing cars, like freedom, demand constant vigilance to ensure that they don't get away from you.

We have yet to drive a car that achieved championship handling "on the limit" that was also comfortable for casual driving. We tend therefore, to think that these characteristics are mutually contradictory.

The steering (as opposed to the handling) starts out by looking good, with a wood-rimmed aluminum wheel and its bright yellow horn button but in motion it's frankly disappointing. There's play at the rim, and the torque required put blisters on our hands. We think the heart of the problem is not our soft palms but the steering gear box itself. Considering the car's weight, it would seem that one of the modern low-friction units found on (hush!) American cars would be welcome here.

The brakes also come in for criticism. Italo-purists lament that Dunlop's "financial inducements" have led Scuderia Ferrari to adopt both their tires and brakes this year. We'll stay out of the tire discussion but we think the factory ought to use discs on the GT cars as well. The present aluminum drum brakes are big and impressive, but disappointing in action. Strange vibrations work their way into either the frame or the steering. These show up on smooth pavements on some models and rough roads for other cars, but every Ferrari we've tried in the process of this test (3½) has caused some complaint in this area. Perhaps the problem lies in the steering geometry which has not been designed to eliminate unwanted vibrations, a specialty of auto engineering too often neglected by special builders.

Our criticism of the Ferrari 250 GT is that it seems to be still too much a special; as it were, a pseudo-road car designed to cash in on the Grand Prix reputation. It's a lovely reputation, but in some respects we can't say the same for the car.

The Berlinetta, having been set-up at the factory for racing with road comfort a secondary consideration, presented the SCCA with a poser. Though they've been built in adequate numbers to be classed as Production Sports Cars, the Contest Board felt that it was "designed primarily as a racing car". This is the same phrase that reasonably enough kept out the quantity-produced Porsche 550 and Jaguar D-types.

George Arents, long a loyal supporter of the marque, has certainly demonstrated the Berlinetta's duality of purpose (and his own stamina) by using this car for racing, cross-country traveling and even for commuting from one end of the isle of Manhattan to the other. We sampled his car under each of these conditions for a total of over 300 miles and must attest that it manages in all of them. We never had to change a plug or even rev the engine to clear one. But lest anyone think the millenium has arrived, we must report that it is far better suited to the race course than anywhere else.

On the other hand, let's compare the two test cars to the old reliable yardstick of "sports cars in America", the MG TC. (No, we're not kidding.) Just as it could, they can be used for touring or as runabouts without hurting the car, though some sacrifices in passenger comfort have certainly been made. Not only that, but they are even more capable of being driven safely, economically and successfully under racing conditions. It's obvious then, that as dual-purpose sports cars, the Ferrari 250s are a success.

We now undestand why the GT prefix is not used on the California. But knowing why, we wonder how the Berlinetta rates it, being ahead only on its bucket seats and parcel space behind them, the larger trunk being filled with a still larger gas tank. Despite its cavernous trunk, we even wonder if the Farina-bodied Coupe would be satisfactory.

However, the thought of a California with bucket seats and maybe even an aluminum body, and with its engine and suspension to Berlinetta specs intrigues us mightily. You see, we like raceable open cars, and if the car isn't suited to a long trip, well, we'll just go on a short one.

*—sfw*

# *Breakfast with Farina*

*by Griff Borgeson*

► Pinin Farina is 65. His beginnings were humble and at the age of 12 he went to work for his brother Giovanni, founder of the coachbuilding firm of Stablimenti Farina. In 1930, when he was 35, Pinin founded his own firm and began the career of original creation that has won him wealth and worldwide fame and honor.

In 1955 Farina turned his company over to his son Sergio and his son-in-law Renzo Carli, both graduate engineers. Under their direction Carrozzeria Pininfarina in Turin has grown to cover almost 200,000 square feet and provides employment for over 1000 workers.

Pinin Farina holds the title of Knight of Labor, his government's highest recognition for contributions to the national economy. He is the only Italian to hold an honorary membership in the Royal Society of Arts in Great Britain, which has bestowed on him the title of Honorary Royal Designer For Industry. He loves cars, motor racing, golf, cats and modern art. He is president of Turin's *Circolo degli Artisti*.

Farina continues to play a vital, essential role in his firm's affairs but, with the main burden of responsibility on younger shoulders, he has time to cultivate his various enthusiasms and to travel, as he puts it, "in pursuit of culture." Midway on a global tour with a fantastic itinerary, Farina recently paused in Beverly Hills to visit with his friends Otto Zipper and Bob Estes, well-known figures on the international automotive scene. And for their friends of the automotive press, Zipper and Estes arranged a relaxed breakfast meeting with the great little man from Italy. Among those present were Gordon Buehrig (designer of the coffin-nose Cord and now with Ford advanced body engineering, John Bond, Bill Dredge, Art Loring, Bill Smith (Ford engineering), Wayne Thoms and Walt Woron. And with Farina was our old friend from Mexican Road Race days, Giovanni Canestrini, vice president of the FIA's Technical Commission and leading Italian automotive journalist and editor.

Farina has the short, stocky build of a son of the soil. His hair is white, his complexion is ruddy and his personality is happy, energetic and outgoing. At the beginning of his global trip, two months before, he had begun to study English. It is indicative of his mental vitality that he already had a very large English vocabulary, including many idiomatic subtleties. Only rarely did he require assistance in translation and his answers were lucid and frank. He began the visit by saying:

"It's good to be here. Every time I come I find things that are really beautiful and, of course, I always find amazing progress. This makes me particularly happy because my relationship and that of Italy with America both are so very good. You must know that we have been greatly helped by your country."

Bond asked, "Why have you decided to go into volume production instead of remaining with strictly custom manufacture?"

"As you know," Farina replied, "we have a new plant. It cost us about $750,000. In it we have a department devoted solely to the manufacture of one-off cars. We receive enough requests from all over the world to keep us on a schedule of 50 one-off cars a month. But we can't do it; there just aren't enough workmen available with the necessary skills. We find it very difficult to build more than ten originals a month because of this shortage of skilled labor.

"Now, naturally, we want to grow. Greater production means greater profits for us, more employment for our people and more money in circulation. The ideal course open to us is small-volume production. If we produce 500 to 2000 copies of a single model and they are distributed all over the world, this is not mass production. In two years, 5000 of our Alfa Romeo roadsters have reached the U.S. Still, days or even weeks may go by when you won't see one . . . or you may see two or three in a day. This is hardly mass production."

Dredge asked, "What is the average daily wage in your new plant and what is the labor situation generally?"

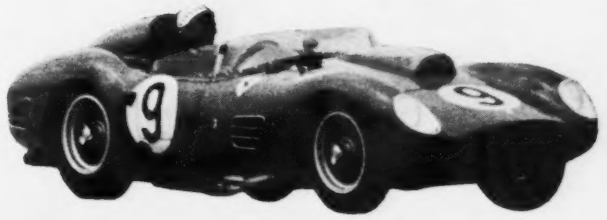
"The *average* is about 50 cents an hour and the cost of living of course, is proportional. Wages have remained pretty stable over the past year but have gone up about 20 per cent in the last five years. We now have a high level of social security in Italy and very, very little labor trouble."

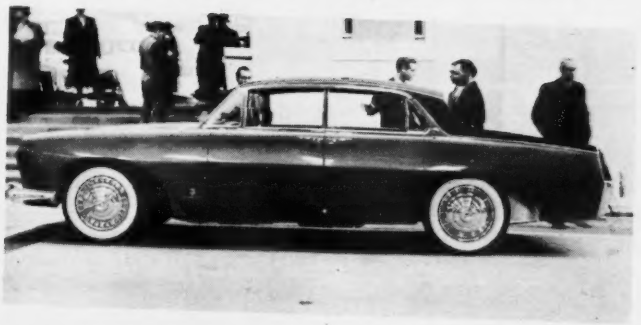
Woron asked, "If I sent you a chassis and wanted a special body, what would it cost?" Farina replied:

"There are two approaches to the custom-body question. The first is to modify one of our existing models for the chassis, assuming we do have models for it, which we have for a great many Italian chassis. Just by altering the top, the moldings and perhaps the fenders we can achieve a highly individual appearance whereas the body actually remains about 70 per cent standard. For example, for the Fiat 1500 chassis we make three very distinct models... but basically they are all the same. If you have a Ferrari chassis and want a body that has a high degree of distinction, we can give it to you for about $1000 by altering the standard model. Just don't ask us to alter the doors, cowl or windshield posts — the core of the standard body.

*(Continued on page 86)*

"all of my designs, they are my offspring..."

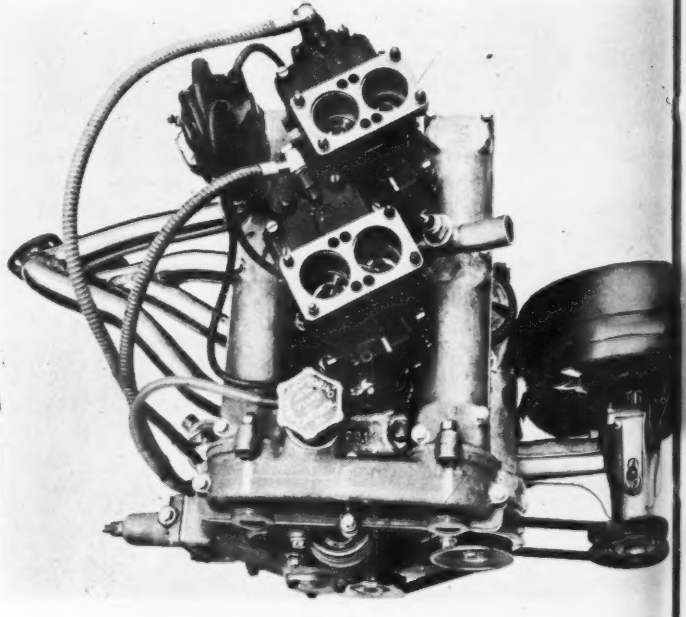


Above: the car was loaned to us by Franklin D. Roosevelt Jr., Fiat-Abarth distributor in Washington, D.C. Here the editor receives information about the car from Mr. Roosevelt, who has little trouble getting his six feet plus height into the tiny machine, the size of which is clearly indicated here.

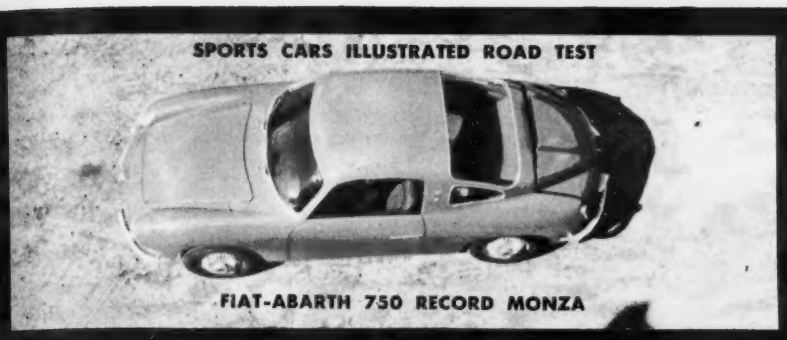
Above and right: the dual overhead cam engine of the Bialbero marks the main difference between it and the earlier push-rod version with the dual overhead roof wrinkles, (SCI, Feb. '59). The twin-cam is equipped with two dual-throat Weber carburetors topped by an air cleaner that does little more than keep out gravel and small birds.

ROAD TEST

# FIAT ABARTH BIALBERO



**SPORTS CARS ILLUSTRATED ROAD TEST**



**FIAT-ABARTH 750 RECORD MONZA**


**ACCELERATION:**

| From zero to | secs. |
|---|---|
| 30 mph | 5.2 |
| 40 mph | 8.7 |
| 50 mph | 13.0 |
| 60 mph | 17.5 |
| 70 mph | 22.5 |
| 80 mph | 29.2 |
| Standing ¼ mile | 20.9 |
| Speed at end of quarter | 67 mph |

**SPEED RANGES IN GEARS:**

(1500-7000 rpm)

| | |
|---|---|
| I | 0-30 |
| II | 10-49 |
| III | 16-75 |
| IV | 24-111 (predicted max.) |

**POWER UNIT:**

| | |
|---|---|
| Abarth "Bialbero" | Water-cooled, in-line four |
| Valve Operation | Double overhead cams, inclined valves |
| Bore & Stroke | 2.40x2.52 in (61x64mm) |
| Stroke/Bore Ratio | 1.05/1 |
| Displacement | 45.6 cu in (747 cc) |
| Compression Ratio | 9.7/1 |
| Carburetion by | Two Weber 36DCL3 twin-chokes |
| Max. Power | 57 bhp (DIN) @ 6200 rpm |
| Max. Torque | 50.6 lbs-ft @ 5000 rpm |
| Idle Speed | 1100 rpm |

**DRIVE TRAIN:**

| Transmission ratios | (overall) | optional ratio |
|---|---|---|
| I | 3.38 (14.67) | |
| II | 2.06 ( 8.90) | 1.75 |
| III | 1.33 ( 5.78) | 1.20 |
| IV | 0.896 ( 3.88) | 1.04,0.87,0.83 |
| Final drive ratio | 4.33 | 4.55,4.87,5.00, |
| Axle torque taken by gearbox case | | 5.12,5.37 |

**CHASSIS:**

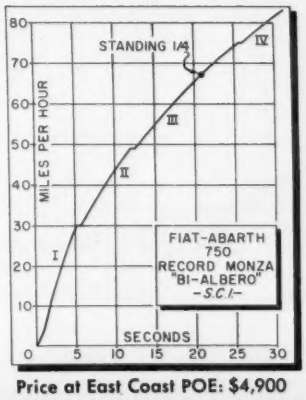
| | |
|---|---|
| Frame | Fiat 600 pressed steel frame |
| Wheelbase | 78¾ in |
| Tread, front and rear | 45½ in |
| Front Suspension | Transverse leaf spring, wishbones |
| Rear Suspension | "Diagonal" swing axle with trailing arm, coil springs |
| Steering wheel turns L to L | 3 |
| Turning diam., curb to curb | 30 ft |
| Brakes | Fiat-Baldwin drum |
| Brake lining area | 70 sq in |
| Tire size | 5.20x12 |
| Rim size | 3½x12 |

**GENERAL:**

| | |
|---|---|
| Length | 137 in |
| Width | 53 in |
| Height | 45 in |
| Weight, curb | 1270 lbs |
| Weight, as tested | 1550 lbs |
| Weight distribution, F/R as tested | 40/60 |
| Fuel capacity | 10 U.S. Gallons |

**RATING FACTORS:**

| | |
|---|---|
| Specific Power Output | 1.25 bhp/cu in |
| Power to Weight Ratio, as tested | 27.2 lbs/hp |
| Piston speed @ 60 mph | 1580 ft/min |
| Braking Area, as tested | 90 sq in/ton |
| Speed @ 1000 rpm in top gear | 16.0 mph |




**Price at East Coast POE: $4,900**

► Rain was coming down in a steady drizzle, a somewhat welcome relief from the previous downpour but still enough to keep the Sebring race course a solid mass of puddles and slick pavement.

As we brought the Sprite past the entrance from the pits to the course a small, grey coupe shot out behind us. About fifty yards astern, it clung like glue as the Sprite skated through the first half left and the second. Going into the esses in third, the Sprite pulled momentarily away but the coupe made up the distance again as the shift was made into fourth. Then into the hairpin in second and the Sprite pulled out a bit. The lower end of third gear gave more distance but again the pesky little coupe pulled up as the speeds got over 70 mph. Into the hard-right, hard-left and then out again onto the airport section. Again the Sprite pulled out, its cubic inches making the difference in torque. And again the coupe gained ground as streamlining and high revs came into play. Down the long back straight the coupe had pulled almost up to the Sprite when the hard right turn onto the next long straight came up through the drizzle. Coming out of this one, the Sprite made up some of the ground but the coupe gained it back by the time the 180-degree turn onto the pit straight came up. And so it went for three laps, the fantastic braking power and slight additional torque of the Sprite giving it the edge on the corners while the little grey coupe picked up on the straights and fast bends.

This was our first introduction to the fabulous little Fiat Abarth Bialbero, or twin cam. The occasion was the first day of practice at the 1959 Soggy Sebring. We were held by the team manager to 6000 revs on this day and apparently the Abarth drivers were also held to some arbitrary rev limit, probably 6500 — some 500 rpm below the red-line. On race day, with dry conditions allowing higher cornering speeds, with the drivers more familiar with the course and the additional revs, these muscular little mites from Turin were simply fantastic. Later, in the wet, their lap times dropped only by a few seconds as they mangled the opposition in their class both in Gran Turismo and in Class H modified as well, beating cars of considerably higher displacement.

Later on they put up equally impressive showings at Daytona and at Pensacola. Actually designed as competition GTs, they have been forced to run in the modified category in SCCA races and have still mopped up.

Just what is this little giant killer? We found out many months after Sebring when Franklin D. Roosevelt Jr. decided to sell one of the team cars and took it out of active competition. Mr. Roosevelt had told us that we could have the first car to be taken out of action and this was it. We were to live with the sizzling little coupe for two weeks off and on and in doing so, we got to know the car pretty intimately. We had to; this car requires attention. No big torque-producer on which you can just poke the button day after day and otherwise forget; this was a high-winding machine that poked 60 bhp out of 45 cubic inches or 747 cc., peaking out at 6200 rpm and capable of revving up

to and beyond 7000 rpm. An engine with this degree of tune requires care and feeding of a high order — and if it's exhilarating speed and class-winning performance you're after, it is worth it. If it's every-day transportation in a machine to hack around town you're after and you have no patience with things mechanical such as temperature and humidity sensitive carburetion and two different sets of plugs, look elsewhere.

We found this out the first day. Mr. Roosevelt had warned us that the Bialbero could develop an appetite for spark plugs, and he was right. We fired up the little red stormer in the lot at Roosevelt Automobiles Inc., in Washington D.C. and it sat there busily purring at a steady 1100 rpm. Things seemed right as Mr. Roosevelt folded his six-feet-plus frame into the car and checked us out. Except for the lack of a choke lever and for the super-light tubular framed seats it was very similar to the rocker-head "double bubble" version we had tested earlier *(SCI, February, 1959)* insofar as the cockpit and general feeling were concerned. With two gigantic Weber 36 DCL3 carburetors, the choke is hardly necessary, a sharp poke at the throttle being enough enrichment when starting. Mr. R. got out of the car and waved us on our way.

The smooth gearbox was just as we had remembered it and the clutch took hold with a smooth yet sharp bite. We headed out of town followed by that smooth drone that only Italian machinery seems to have when it's healthy and hot, a sound not unlike that of a cello string under the influence of an infinitely long bow. This smooth note lasted until we approached the New Jersey Turnpike for the haul North. Then it turned slightly ragged above 5000 rpm, but only in top gear. From then on it got worse while we searched for a shop that carried N-3 plugs or the equivalent range. While conducting this search we found that the exhaust pipe which had been coated a nice gray-black inside originally was now whitish-tan a sure indication of a lean mixture. Inspecton of the plugs showed electrode pitting and pure-white insulators, the clincher — too lean a mixture and too hot a plug range.

A new set of plugs was finally found and the sputtering turned back into its original healthy drone. But by the time we had gotten to Connecticut the drone again disappeared to be replaced by that ominous ragged note that betokened the sputtering and popping to come. Another set of plugs had been gobbled, one plug so badly that the center electrode had turned into a sort of metallic sponge and fell off at a thumbnail push. We were on home territory by now and so located four side electrode racing plugs. But without the special gapping tool needed for this type of plug, the gaps were uneven and so was the car. Up to 5000 revs it was fine — anything over that started the sputtering.

The next morning we headed — slowly — to Imported and Domestic Service where Joe Virag had rebuilt the SCI Twin Cam MG. Joe looked at the car, then at the mangled mess of plugs we dredged out. Then he listened intently.

Above: Cockpit of the Bialbero is roomy although headroom gives way to the smooth exterior shape. Speedometer on right reads to 160 mph, the tach to 10,000 with the red line at 7,000. Lightweight seats (below) were installed for Sebring. Although padding is minimal, the seats are comfortable and obviously give good lateral support.

"It could be a valve, in fact it sounds like it," he said. "Let's check."

Out came the compression gauge. All cylinders checked out within a pound of each other and we breathed a healthy sigh of relief. The thought of facing Mr. Roosevelt with the report that his car had sucked a valve hadn't made the day more pleasant.

"It has to be carburetion" was the verdict. It was then that we found the major trouble. When the car was taken out of competition it was no longer under the tender care of Team Roosevelt's *meister mekanniker* Jim McGee. In Washington it had been tuned by someone not entirely familiar with Weber DCL3's or with this particular breed of car. In attempting to get a nice smooth idle this worthy had closed the air adjustment and opened the butterflies a crack on one carburetor and had opened the air adjustment and closed the butterflies tight on the other. The effect was a smooth idle with the throttle closed since the fuel/air ratio was approximately equal. When the throttle was cracked the accelerator pumps took care of the difference through over-richening at first. But the mixture leaned out as the revs went up until it was lean enough to chew up the coldest range of street plugs we could find. Further, in order not to load up at speeds enforced in town, the main jets had been made too lean for top end running, aggravating the situation.

The first step was to correct the low-end balance, a procedure requiring a stethoscope. These carburetors are *not* supposed to hiss, at least not on this car. The cam timing is quite wild, it has to be to deliver the poke that comes from this engine. At a fast idle this creates a popping back into the intake. It's not a severe pop as in a poorly timed engine but it's there. When the carburetors are properly set and synchronized this popping noise can be heard in each of the four throats with a stethoscope. A rough starting point to achieve this is to back out the air screws between a quarter and a half turn. Then the butterflies are cracked just slightly until the pop becomes audible in the 'scope, all linkage between the carburetors having first been disconnected. Then the air screws are adjusted until the right idle, an even buzz, is achieved. This is further checked by the 'scope to make sure the barely audible popping is even on all throats.

The second step was to drill out the main jets one thousandth. Later this was found not to be enough for full-bore operation on a warm day but for normal road travel this worked a final cure. Plugs, N3's, stayed with the car and the little bomb would rev happily up to its red line at 7000, at least momentarily which is all that is needed on the road through the gears. Anything over 4500 rpm in top gear is sufficient to bring about immediate arrest on any public road since the exhaust note alone is sufficient to raise the hackles of any policeman within half a mile. Couple this to a bright red paint job and 15 miles per 1000 rpm and it can readily be seen that even 5000 revs in fourth is tantamount to handing in one's driver's license.

We could now begin to enjoy the car and enjoy it we did. The Bialbero thrives on driving that would have a larger or lesser machine in the ditch in minutes. If the big 10 thousand rpm tachometer is kept above 3000 in the gears, the acceleration and feeling of power in this small package is truly amazing. Couple this with road holding of the highest order — once you get used to the oversteer similar to an early model Porsche — and it is obviously apparent that this machine begets exhuberance. It did for us.

On the tight, twisting back roads of New England it really came into its own and would maintain an average speed at a steady rate that another machine would have to produce tremendous bursts of intermittent speed to equal. For instance, if 55 miles an hour were wanted on one fairly twisting road, we could put the speedometer needle on that figure and hold it there. A car with lesser roadability would require intermittent bursts of 70 to make up for the equally intermittent drops to 40 that would be necessary on the turns.

Acceleration from a standstill is not sudden. Equipped with a 4.33 to 1 final drive ratio and with an engine that doesn't build peak torque until 5000 rpm is reached, the car can't be expected to be a dragster. Once nudged off the line, however, the Bialbero builds revs at an astounding rate, reaching over 70 in third gear over a standing quarter mile. In fact it doesn't really begin to come into its own until it gets up to around 60 to 70 mph when the smooth aerodynamic shape begins to account for itself as witness the duel with the Super Sprite mentioned earlier. At just the point where the wind resistance was beginning to make itself felt in the more powerful Sprite, the slick body lines of the Abarth were asserting themselves.

During one part of the test we were also running a test on the Sebring Sprite (see next month) and were able to run off a standing quarter between the two cars. Just as at Sebring the Sprite pulled out ahead at the start and continued to do so up through second and the lower end of third, gaining almost a car-length lead. As the higher revs in third were reached, somewhere around 60 mph, the Abarth began to make up the ground. Over the quarter mile it was a dead heat. The Bialbero is obviously at its best on long fast courses where aerodynamics and willing revs in the top ranges are more important than sheer beefy torque.

Every day that we had the car, we became more and more convinced that the Bialbero, in contradistinction to its rocker-head brethren, is a racing car that can be used by the enthusiast on the street whereas the rocker version is a sports car than can be used for racing. The Bialbero is a car for the enthusiast and a pretty pure type of enthusiast at that. It is an amazing car but like anything hot it is a bit cantankerous at times.

Set up for the street as Virag had it, the car was perfect in an enthusiast sense. Quick, sure footed and amazingly fast, it was fierce but useable. However, when it came time for the full bore performance testing, it showed its desire for proper care and feeding. Immediately the really fast and sustained operation started, just as immediately did it redevelop its earlier

*(Continued on page 94)*

**Above and below: The usual trunk space under the hood is neatly filled by gas tank and spare tire. Huge amounts of luggage can be accommodated on the shelf behind the forward-pivoting bucket seats.**

**Below: The Bialbero corners without excessive lean and has an oversteering Porsche-like feel.**

# THREE RACES

*by Jesse L. Alexander*

► The founder of the traditional Targa Florio road race died in January of this year. Vincenzo Florio was 76 years old and had put on 42 installments of his own private race up to the time of death. Since 1906, The Targa Florio has been catching the fancy of motoring enthusiasts all over the world, and in recent years the event has been given international significance by counting towards the World Sports Car Championship. The Targa has not always been run over the same circuit. In the beginning, from 1906 to 1911, it was disputed over the *"Grande Circuito delle Madonie"* in which one lap was worth 92 miles! There was also a *"medio circuito"* and today the Targa is run over the *"Piccolo Circuito"* of the Madonie mountains in the coastal regions some 50 miles southeast of Palermo. This "small circuit" is 45 miles per lap, but the only hitch is that to count for the Championship, a car *must* do 14 laps altogether, a total distance of 1008 kilometers!

A thousand kilometers of the Targa circuit is probably the most punishing treatment one can mete out to a sports car. The very nature of the circuit favors the small, lithe machine with a favorable power to weight ratio. As Herbert Linge of Porsche said, "It was made for us". His words were prophetically borne out by the results: Porsche 1-2-3-4. Why did Porsches win in Sicily? First of all, because all four factory Ferraris broke their rear differential casings before the race was ¼ over. Up to that time, the Behra-Brooks 3-liter and the Gurney-Allison 3-liter were setting the pace, but before Brooks could get in his car. Behra had it upside down in a ditch. Crawling out, Behra recruited the local peasantry to get it rightside up and back on the road. He then managed to drive the badly bent Ferrari to the pits where Tavoni told Tony Brooks to get in and see what he could do with the car. He managed to do a full lap but then the differential began to grumble. Gurney had already retired at the pits for the same reason and the Cabianca-Scarlatti 2-liter had by then siezed its gearbox. Last car to retire was the Gendebien-Hill Ferrari likewise with a broken differential. Actual reason for the Ferrari trouble was this: the Sicilian circuit demands that first gear be used 70% of the time, this put a strain on the differential casing that had not been experienced at Sebring. Interestingly enough, all the cars except the 2-liter V-6 were driveable but not raceable, i.e., were driven back to the garage from the circuit. It is expected that by the time for the Nurburgring 1000 km race Ferrari will have designed a new differential casing, strong enough for the job.

Huschke von Hanstein had welded together a strong team of drivers for the Targa Bonnier-Trips, Hans Hermann-Umberto Maglioli (making his return to racing), and Edgar Barth-Wolfgang Seidel on the works cars. Two Carreras were on the list, both works entered, one privately prepared. The Maglioli-Hermann car was a Sebring RSK while Bonnier and Von Trips were given the new type of car with the experimental triangular wishbone rear suspension. The Barth-Seidel machine was a 1500 cc RSK.

Watching the race cars wind up the twisting, narrow mountain road from our vantage point at the Ferrari tire depot, slightly over half-distance around the circuit, it was obvious that the Porsches were having an easy time equalling Ferrari lap speeds. The tremendous horsepower available in the 3-liter Testa Rossa was not fully useable due to the simple fact that it produced too much wheelspin. There were extremely short straight stretches between corners allowing insufficient room for the car to accelerate properly. The Porsche, with its much more favorable power-to-weight ratio could utilize the Targa circuit to maximum advantage. On the one bit of long straight road along the coastline, the Ferrari and Porsche were equally fast since both cars were geared for the mountains and running a low final cog.

But Porsches were not without troubles. The Maglioli-Hermann car had gearbox difficulty and Hans Hermann was forced to stop out on the circuit — miles from anybody. Not wanting to leave the RSK in the hands of the natives, he stayed with his machine — drivers of other cars tossing provisions to him as they passed. He was finally rescued at 10 PM that night, after being with the car for over 12 hours! Bonnier and Trips pushed their RSK extremely well for the better part of the race, despite a fluffing engine at low revs. Bonnier jumped into the lead as soon as the Behra-Brooks and Gurney-Allison Ferraris were out of the picture. But a Targa win for Bonnier and Trips was also not in the cards; the experimental rear wheel suspen-

# TARGA FLORIO

*1959 Targa Florio Results:*

1. Barth-Seidel (Porsche 1500 RSK) 11 hrs, 02'21 4/5", average speed=56.6 mph. (last year's=58.7 mph)
2. Linge-Strähle-Mahle (Porsche 1500 RS) 11 hrs, 22'20 4/5"
3. Von Hanstein-Pucci (Porsche 1600 Carrera GT) 11 hrs, 31'44 2/5" Gran Tourismo winner up to 2 liters, average speed=54.2 mph
4. Strähle-Mahle-Linge (Porsche 1600 Carrera GT) 11 hrs, 36'10"
5. Boffa-Drogo (Maserati A6GS 2000) 11 hrs, 41'20" (53.5 mph)
6. Sepe-Davis (Alfa-Romeo Zagato Giulietta) 12 hrs, 02'09" (51.5 mph)

Fastest lap: Bonnier (Porsche RSK) 43 min., 11". 48 starters, 21 finishers.
Weather: sunny and hot.



Top: Edgar Barth storms a typical Sicilian hill in the winning Porsche RSK. The small cars from Zuffenhausen were ideally suited to the tough, tight Targa course. The Ferrari threat never quite materialized as one after another of the big red cars broke its rear axle. Bottom: Tony Brooks signals to a Ferrari mechanic as he nurses his sick car into the team's tire depot at Madonie—just half way around the circuit. The car had been crashed by his team mate Jean Behra just prior to its being taken over by Brooks. After the crash Behra had to recruit a team of spectators to help him lever the car back on to its wheels.

sion broke as the Porsche was on its last lap and the car never reached the pits. The result was that the steadily-driven 1½-liter RSK of Barth and Seidel moved quietly into the lead. Scoring second place was a 1½-liter RS Spyder driven by Strähle, Mahle and Linge. Targa sensation again this year was the 1600 Porsche Carrera driven by Von Hanstein and Pucci; we were lucky enough to be able to drive this Carrera the day after the race and our impressions of the car are included in this issue.

German cars and drivers have always had limited success in the Targa. Mercedes has won the race three times, in 1922, 1924, and of course in 1955 with the 300SLR. Porsche has now won the Targa Florio twice and the 1959 win was exactly 35 years after Christian Werner drove the victorious 2-liter blown Mercedes in the 1924 race; a Mercedes racing car designed and developed by Professor Porsche when he was with Daimler-Benz.

The Ferrari debacle was undoubtedly one of the worst in the history of the Scuderia. The cars were most unsuited to the circuit and compared to the Porsche, the 3-liter Testa Rossa was a huge, ungainly monster with a 60 foot turning circle, suitable only for such courses as Sebring or Le Mans.

For Porsche, the Targa Florio win was an unexpected victory and due in large degree to steady, reliable driving, rather than sheer ability. If all the Ferraris had been running at the end with the Porsches still – 1-2-3-4, we'd feel like crowing even louder.

Left: The winning Porsche with Barth up takes an 1100 OSCA on the outside. Bottom: The same car is refueled during the race in an atmosphere of hectic expectation. The Porsche sweep of the first four places was a tribute to both the cars and team preparation.

Above: The second place 1500 RS brushes by the photographer on its way up into the mountains. The other two high-placed Porsches were 1600 CT Carreras—both of which averaged only 2 mph or so less than the full-house RS and RSK sports racers.

Top: American Dan Gurney has a look of intense concentration as he bends his 3-liter Ferrari around one of the thousand turns that make up the Targa Florio course. Bottom: Proof positive that the Targa is not an airport circuit—a 2-liter Maserati goes by minus its engine hatch and most of its aluminum paneling in the rear.

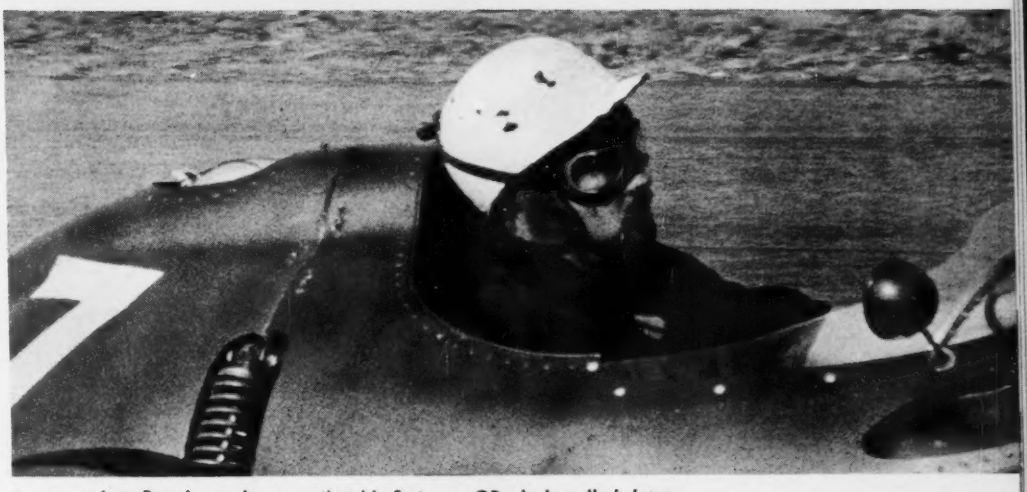
The only thing you need to go auto racing in Sicily is a car. The Targa Florio is run on the open road—see above—without undue thought about spectator's safety or solid stone walls.

Joakim Bonnier shows the way around to the rest of the field at Zandvoort. It was the first Grand Prix win for both Bonnier and the under-dog BRM.

1959 Dutch Grand Prix: May 31, 1959:
Official results:

1. Joakim Bonnier (BRM) 2:05'26.8", average=93.3 mph.
2. Jack Brabham (Cooper-Climax) 2:05'41".
3. Masten Gregory (Cooper-Climax) 2:06'49.8".
4. Innes Ireland (Lotus) one lap behind.
5. Jean Behra (Ferrari) one lap behind.
6. Phil Hill (Ferrari) two laps behind.
7. Graham Hill (Lotus) 2 laps behind.
8. Maurice Trintignant (Cooper-Climax) 2 laps behind.
9. Cliff Allison (Ferrari) 4 laps behind.
10. Carel de Beaufort (Porsche 1500 RSK) 7 laps behind.

Fastest lap: (record): Stirling Moss (Cooper) 1'36.7".



A very serious Bonnier makes sure that his first ever GP win is nailed down.

# ZANDVOORT

▶ In a race which was undoubtedly the most exciting we have seen this year, Joakim Bonnier drove a BRM Formula I car to victory in the 1959 Dutch Grand Prix at Zandvoort, Holland on May 31st. Stirling Moss drove a magnificent race in an attempt to snatch the victory away from the rival British car, but, as at Monaco, bad luck again plagued him when the Collotti gearbox siezed a bearing. Other outstanding drives at Zandvoort were those of Masten Gregory in a Cooper-Climax, Graham Hill in the 2.5 liter Lotus and smilin' Jack Brabham in the works Cooper-Climax.

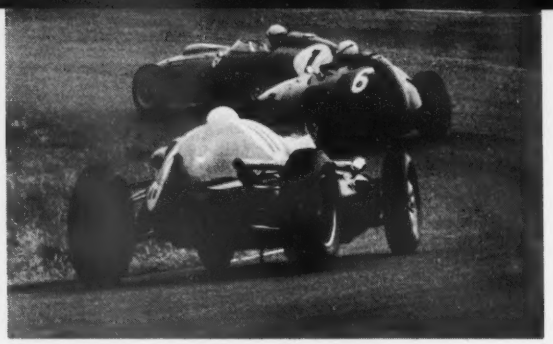
For more than a week before the scheduled date of the Grand Prix, there was almost continuous activity at the Zandvoort circuit. Dunlop and BRM persuaded Stirling Moss to try the BRM there and he managed to complete a distance of a full Grand Prix and a half without any mechanical troubles. During this trial, Moss set an unofficial lap record of 1 min. 35.5 seconds, which compares with his record race lap of 1 min. 37.6" last year in the Vanwall. Still, this fine performance by the Owen-Racing Organization's car did not convince him sufficiently to drive the car in the actual race.

He did additional testing at the wheel of the Rob Walker Cooper — and came within a second of the BRM record; this fact coupled with the brake failure in the BRM that he drove at Aintree must have carried considerable weight with Stirling, for the Dutch course at Zandvoort is a true "Cooper-circuit". It is an artificially laid out structure, 2.6 miles long, set in amongst the sand dunes of the Netherlands coast 30 miles due west of Amsterdam. Road-holding is of prime importance, as is power low down in the rev range. Brakes are not stressed terribly, in fact there are only two places where you actually use anchors on this circuit. The surface is excellent but very abrasive, and Dunlop was considerably worried at the end of practice about tire wear in the 75 lap race; tire changes were expected to be necessary on the Coopers for they could not go to 16 inch wheels. As it turned out the Dunlop trepidation was unfounded — the chief race engineer being 1-mm out on his tire wear prediction at the close of the Grand Prix, (this due to the amount of oil laid down during the course of the early laps and also because the field simply did not go as fast as they had in training). All of the Formula I cars were using Dunlop R5 racing rubber with the exception of the Aston-Martins which had Avons similar to those used on the Aston sports cars.

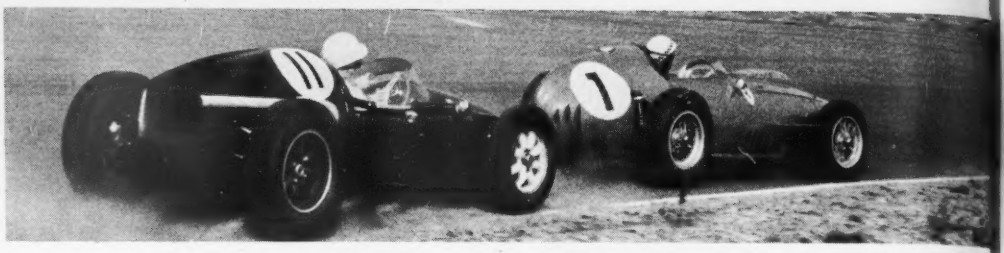
Jo Bonnier surprised us all at Zandvoort. He had the cream of the Formula I crop breathing down his neck but refused to be rattled. Stirling Moss did his damndest to pull the race out of the hat using the Cooper-Climax to its very utmost. He managed to lead for all of 3 laps — some fifteen laps before the end of the race — but a mistake in the assembly of the special gearbox brought him permanently into the pits at the end of the 63rd lap. Thus the BRM story went into a new period with this victory. It was all the more significant at this particular time because the Bourne racing team had just received a verbal slap in the face when it was announced that Mr. Owen, the BRM boss, had decided to lend a car to the British Racing Partnership owned by Alfred Moss and Ken Gregory. This vote of no confidence from Bourne found the BRM team deep in the dumps at Zandvoort but thanks to meticulous preparation of the race cars and to a nice piece of luck, they were able to see one of their cars driven home to victory in an international Grand Epreuve. What will become of the BRP-BRM effort is not yet clear but without Moss himself willing to drive it, it will certainly not get very far. Stirling does not really know as this is written what car he will drive in the Grand Prix of Europe at Reims but David Yorke, the Vanwall team manager, was in Moss' company at Zandvoort and the favorite rumor was that Stirling would drive a new, light, Vanwall at Reims. The Italian gearbox specialist, Colotti, has been in England for some time recently, presumably working on the car. It has also been suggested that Stirling would drive a works BRM at Reims; no doubt Bonnier's win at Zandvoort has given Moss food for thought.

The BRM will be on equal terms with the Ferrari at Reims. At Zandvoort, the Bourne car showed exceptionally good roadholding and handling, and gave no power away to the Ferraris on the single straightaway. While the Ferrari is a reasonably reliable machine, even with bad roadholding, the BRM up to now has been far from reliable. Biggest headache has been the problem of damping out the terrific vibrations emanating from the four cylinder engine. The "vibromaster" four banger has been *the* reason for past brake failures as "T" junctions are prone to shake loose. Also, as the fuel tank empties, the chassis begins to flex, causing undesirable vibrations at several points throughout the car. But now that this 2.5 liter BRM is finally getting to the point where it is actually winning races, the news filters through that the Owen Racing Organization has a newer, lighter, yet more powerful machine approaching completion. It has been drawn up on the basis of the new Formula in 1961, but it most probably will appear before then with a 2.5 powerplant.

If Ferrari was in a sad state with their sports cars in Sicily, it couldn't have been much worse at Zandvoort with the Formula I car. Looking back to the previous year, however, it really isn't surprising that they were in trouble again at Zandvoort in 1959. It seems that it is purely a question of roadholding and it bordered on absurdity the way the cars from Maranello were being walked over by everyone



Left: Moss, Schell and Behra engage in a cut and thrust fight during the early laps of the Dutch GP. Far left: Graham Hill in 2.5-liter Lotus drifts along over Zandvoort's abrasive surface. He finished 7th overall. Below: Stirling Moss scratches in the sand trying to get by Behra in one of the Ferraris. He finally made it on the next corner.



else. It would seem that BRM has now been able to design a Formula I car that is suited perfectly to each different circuit. Ferrari cannot say the same. Their cars should do well at Reims, Avus and Monza, three races out of the season of seven in which the red cars should be in front. It is extremely difficult to build a car that will go as well at Aintree as it will at Avus or at Monza and that is one of the problems facing the modern Grand Prix car designer. As the trend of Formula machines continues to smaller vehicles, Ferrari continues to build a classic Grand Prix car, big, powerful, noisy and RED.

The interim answer to the Ferrari problem could be the car that Behra drove at Zandvoort. A Formula I engine putting out well over 290 horses was slid into a chassis similar to, but not exactly like, the Ferrari Formula II car. In this slightly lighter car, Behra was able to turn the fastest Ferrari practice lap of 1 min. 36.6. With the roadholding properly sorted out, this Ferrari may be the one to knock off the English machinery. Since the Dutch race, the three Ferrari Formula drivers, Behra, Brooks and Hill, met at Monza with the race cars and the engineering brains from Maranello in an effort to sort out the handling problem. Ferrari was also experimenting with a 2.2 liter V-6, Behra having advised them to have such an engine for Monaco but it was not ready in time. The Ferrari refuses to go through a corner in a safe and sound drift. If the driver wants to make a fast training lap — really "hang it out" — he must reckon with a very erratic and vicious motorcar that will break away at the rear at a certain — always indeterminate-point and it is impossible for the driver to find the proper throttle setting to keep the car on the edge of under or over. They have done everything imaginable to the car, fiddling about with different springs and shock absorber settings, stronger and weaker anti-roll bars — the lot — but have gotten absolutely nowhere. The Ferrari drivers all agree that their cars are monstrous to drive fast but can never agree on anything more than this. Chief engineer Chiti and his mechanics have worked all night long at some of the races changing engines and suspension components constantly in an effort to meet the various requests or ideas put forth by the drivers. It would seem that they should hire Uhlenhaut for a few races!

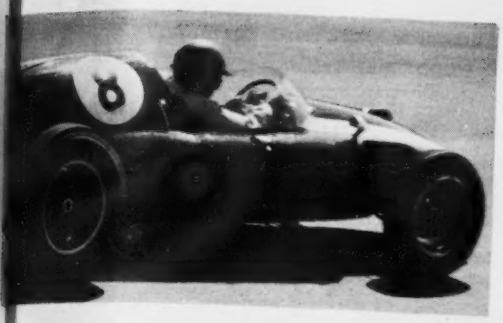
The devices from Surbiton went around Zandvoort as if John Cooper himself had laid out the course. Jack Brabham and Masten Gregory had works cars, Brabham's being the very latest chassis to come off the jig. Along with the Rob Walker cars, the factory Coopers suffered from gearbox malfunctions, it being impossible to completely engage a gear at certain times. On Jack's car, a special reserve oil tank had been fitted, enabling the driver to "top up" the level in the gearbox, for losing oil has been another one of the popular things for their boxes to do. The Cooper-Climax's weight is put at 10¾ cwt. or 1204 lbs. Weight of the BRM is not available but it is presumed to be close to this figure, if not less. Interestingly enough, it was determined that the latest Cooper-Climax is ever so slightly bigger in dimensions than the BRM. John Cooper's "small racing car" is getting bigger all the time!

The Lotus exhibition at Zandvoort was also quite astounding, for not only was Colin Chapman's team first to arrive on the scene, it even hired the circuit for an afternoon to sort out pre-race problems. Their two Formula I cars were beautifully turned out and had undergone some testing in England since the unhappy experiences at Monaco. The gearbox has been beefed up this year, basic bits and pieces remaining the same, but the interesting selector mechanism has been slightly altered with the selection rod reversed in position so that it goes into the box directly without an angle requiring a crank rod. Graham Hill, Chapman's number one team driver, learned the circuit in a rented Volkswagen, then was able to set some very impressive training times, culminating in a 1 min. 36.7, only one tenth of a second slower than Behra's best. Even more astounding was the performance of newcomer Innes Ireland, in his first Grand Prix drive; he clocked 1 min. 38.3" — even faster than the best that Phil Hill could do — only a further indication of how serious the Ferrari handling problem was at Zandvoort.

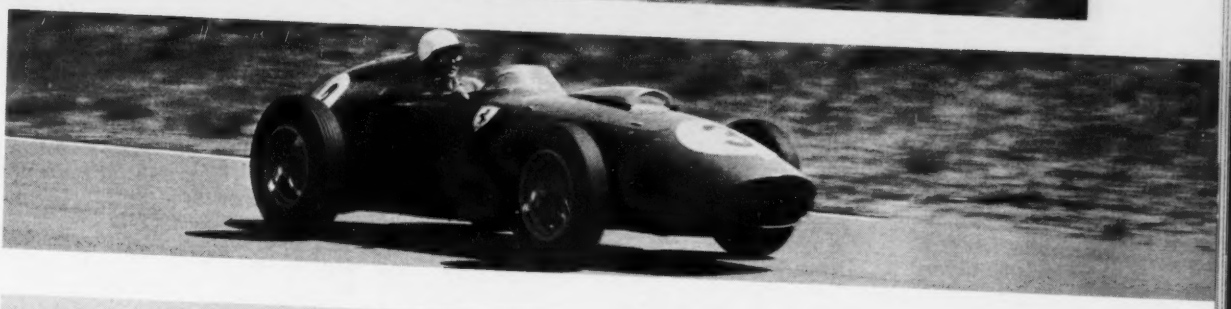
The Aston-Martin GP cars made their first Continental appearance at the Dutch Grand Prix. Looking very much like 250 F Maseratis, the two beautifully turned out cars were shepherded by Reg Parnell. The first 2.5 liter Aston-Martin crankshaft was born back in 1955 and a motor of that size was fitted to a sports car and run in one or two races the following year. Very conventional in layout, the Aston-Martin is just too little too late, despite the fact that it is very fine to see the car in competition. Handling is first class but power output is less than most of its competitors. The car has a very solid look to it and it's our guess that the Astons are the heaviest of all the cars on the grid. Both Shelby and Salvadori retired them with engine trouble before the race was half over. Carroll's siezed on him in the middle of a very fast corner and he was extremely lucky to get out of the car without a scratch — one end of the car was tottering over a deep drop when it finally came to rest. Salvadori's car came into the pits after two laps with the temperature gauges going off the clock.

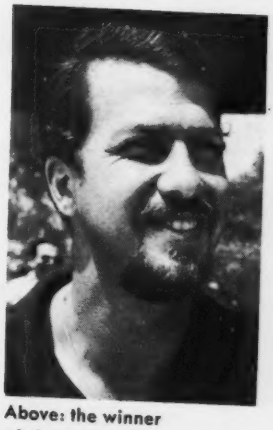
So much for Zandvoort; next Formula I event will be at Reims, France: the Grand Prix of Europe, and will include a race for both Formula I and Formula II cars. No 12 hour sports car race this year.

—*jla*



Above: Australian Jack Brabham tries hard in his Cooper-Climax. His reward—2nd place behind Bonnier's BRM. Above right: First time out for the Aston GP car was not a success. Both cars retired with engine trouble. Right: Phil Hill practices in one of the team Ferraris. Winner Bonnier practices with the BRM.





Above: the winner of the 1959 Dutch Grand Prix. Left: The BRM crew let loose after long last helping to boot home a winner.

Above: The Nurburgring course winds through the countryside around the Nurburg castle in background.
Below: As usual, Stirling Moss was first into his car and first to move.

# NÜRBURGRING

V. International ADAC 1000 Kilometer Race, Nürburgring, June 7, 1959. 44 laps—

*Results:*

* 1. Stirling Moss/Jack Fairman (Aston-Martin DBR1 300) 7 hr. 33′18″.
Average speed=82.3 mph.
2. Olivier Gendebien/Phil Hill (Ferrari V12 TR) 7 hr. 33′59″.
3. Tony Brooks/Jean Behra (Ferrari V12 TR) 7 hr. 36′45″.
* 4. Umberto Maglioli/Hans Hermann (Porsche RSK) 7 hr. 40′57″.
Average speed=81 mph.
5. Dan Gurney/Cliff Allison (Ferrari V12 TR) 7 hr. 34′40″.
Completed 43 laps.
6. Walter/Heuberger (Porsche RSK).
7. Von Trips/Bonnier (Porsche RSK 1500).
8. Cabral/Nogueira (Maserati 300S).
* 9. Beurlys/Blary (Ferrari 250 GT).
Average=73.3 mph.
*10. Walter/Strähle (Porsche Carrera).
Average=72.9 mph.
11. Busch/Heins (Porsche Carrera).
12. Günther/Zick (Porsche Carrera).
13. Rodriguez/Levine (Porsche 1600S).
Average=72.4 mph.

23rd overall—first in GT up to 1300cc—Lumsden/Riley (Lotus Elite—70 mph.).

Fastest lap: Moss (Aston-Martin) lap 11 9′32″ =89.1 mph.

* = class winners

Starters: 67 Finishers: 42

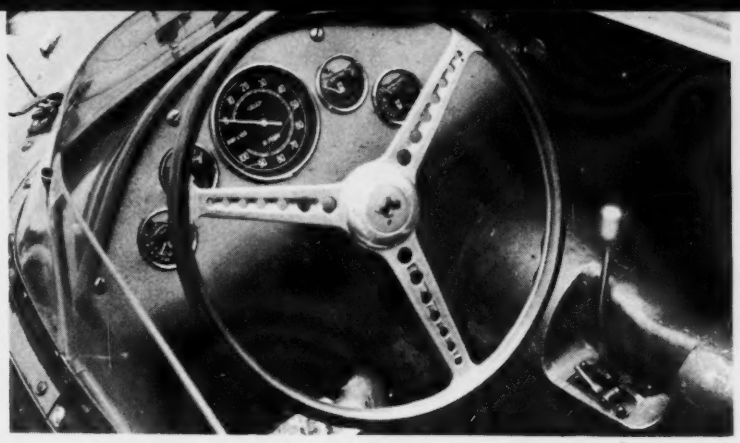
► There were over 230,000 spectators assembled around the Nürburgring for the 1959 ADAC 1000 Kilometer Race, a figure that recalls the pre-war years, when crowds came from all over Germany to see the legendary Mercedes and Auto-Union battles. With such an unexpectedly high turnout, the organizers of the Formula I Grand Prix must be wondering if they have done the right thing in holding the German Grand Prix at Avus in Berlin this year.

The 1000 km race was the third successive victory on this track for Aston-Martin and it is indeed difficult to understand how the Aston can do so well here at Nürburg and still so badly at Le Mans. For the David Brown racing team, the Nürbringring race was a dress rehearsal for Le Mans, and this year the Aston-Martin is going to do everything it can to snatch the race away from Ferrari. If luck continues to smile upon Moss and the DBR1-300, we can easily see this combination throw the Manufacturer's Championship wide open. At the end of the 1000 km *rennen*, the point standing was as follows:

Porsche 15 Aston-Martin 8
Ferrari 14 Maserati 2

Stirling Moss did himself proud in the Aston-Martin on the Nürburgring, and for those of us who had seen victory snatched away from him at Monaco and at Zandvoort in the Formula I Cooper-Climax, we were doubly pleased to finally see him on the winner's podium. Teamed with "Jolly Jack" Fairman, Stirling's Aston was the only works-entered car, although Graham Whitehead had entered a similar car under his own name. This "private entry" went faster in training than the factory car and Reg Parnell spent considerable time with his mechanics trying to figure out why.

Ferrari had managed to rebuild all the bent and broken machinery left over from the Targa Florio in time for the 1000 Kilometer Race — but only barely, for sev-



Far left: Stirling Moss seems to be interested in the Aston's tires during practice. Left: Cockpit of the Dino 196 with drilled and contoured steering wheel spokes and 10,000 rpm tach.
Below left: Moss at speed in the winning Aston Martin.
Below: Tony Brooks passes a TR-3 allowing plenty of room after having been pushed off the road last year by a 403 Peugeot.

eral cars arrived late. Two of the three 3-liter Testa Rossas had been fitted with the latest version of the V-12 engine, a much modified powerplant quoted at 340 bhp. The power curve is much better than the previous engine with a good thousand more revs available at the top end. Outwardly, the engine looks the same as before, unless one notices the larger diameter carburetor chokes. But with this 340 horsepower V-12 in their weapons for Le Mans, Ferrari is going to have the most powerful cars on the track. It's just too bad that Moss isn't signed up with the Maranello team.

The Aston seems to be superior on braking. If this is true, it explains the huge chunks of time that Stirling was able to knock off on every lap at the 'Ring, from the beginning he put a huge distance between himself and the closest Ferrari, driven by Dan Gurney, and also after half distance when Fairman put their Aston into a ditch. Luckily, by sheer brute force, he managed to push the car up into a position where he could get some traction.

Once again the 2-liter Ferrari failed to live up to its expectations. In the Targa Florio it was gearbox; on the 'Ring the motor blew up — with holes in all the pistons. Again, Scarlatti and Cabianca were driving the Dino 196, under the colors of Scuderia Eugenio Castellotti.

From Porsche there were few real surprises on the Nürburgring though they made every effort to win the race outright. Von Trips shook everybody by turning an incredibly fast training lap of 9'45.5" in the latest type RSK. Considerable doubt was cast on this time, even by Trips himself who felt he could never go that fast again. On race morning, approximately an hour before the start as the mechanics were warming up the Trips-Bonnier Spyder, they detected a strange, most unhealthy noise. Wasting no time, the Porsche mechanics whipped out the engine, replacing it with a spare 1500 that they had on hand; the whole change took slightly more than a half hour!

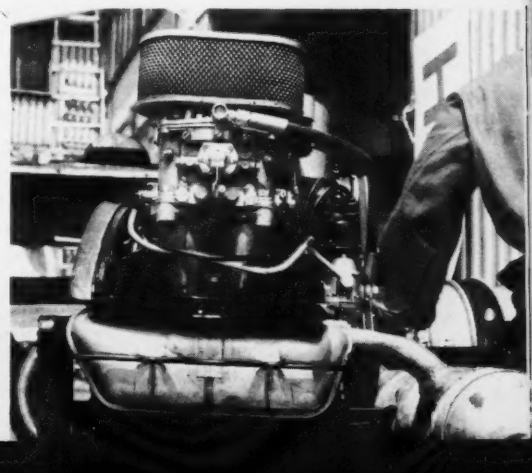
Umberto Maglioli and Hans Hermann were teamed up on a works Spyder and finished fourth overall, ahead of the Gurney-Allison Ferrari which was suffering from clutch trouble.

The Porsche factory brought two special cars to the 1000 km race. One was a push-rod 1600 Super coupe that put out quite remarkable steam. Factory driver, Edgar Barth, took the Super around the 'Ring in 11'08", a time that many Carrera drivers find hard to equal. In the race, the Super was driven by Levine and Rodriguez. It finished 13th and averaged 72.4 mph! Also on hand was a special GT Carrera driven by Linge and Pucci. This car was fitted with experimental disc brakes on the front wheels.

Another surprising and welcome success in this world championship event was the 1100 cc class win by a Lotus Elite, driven by Peter Riley and Peter Lumsden. This stage 3 tuned Elite not only won its class, beating a host of Giuliettas, but also took fastest lap in the 1001-1300 cc GT class. Its owners were not at all optimistic during training about the car's chances of finishing the race, but the little fiberglass sports racing coupe has finally proven itself on a most difficult circuit. The owners intend to still modify the suspension slightly for it was bottoming in several places on the Nürburgring. We expect the Elite to do equally as well this year at Le Mans.

Among the many Giuliettas on the Nürburgring for the 1000 km race was a very well-driven Veloce Spyder, handled by two American servicemen, Warren King and his co-driver Linder. They were very fast in training but the notorious Alfa electric system gave them trouble in the race. Warren King may be a man to watch in sports car racing both in Europe and in the USA when he returns home. —*jla*

Above: Pit signals the Brooks-Behra Ferrari that it is 64 seconds behind Moss. The next lap it was 75. Moss was fast.
Right: Ecurie Ecosse!
Below: The new Porsche 1600S engine as it appeared at the Nurburgring this year.


# TARGA CARRERA

*by Jesse L. Alexander*

► Violent, noisy, and with Spyder-like acceleration; this just about sums up the performance of the factory GT Carrera that we had the pleasure of driving recently in Sicily. The car, driven by Von Hanstein and Pucci, had just won its class in the 1959 Targa Florio by averaging 54 mph for the 1008 kilometers and finished in third place overall. Race numbers, straight through exhaust, a slight gash on the right door, and countless mashed bugs all over the front, attested to the ordeal to which this particular Carrera had just been subjected. Now it was patiently waiting for us to thrash it some more, so it could prove to us that it considers itself THE most reliable competition GT car on the road!

At Von Hanstein's urging, we slipped behind the wheel—down into the narrow bucket seat. Without the slightest hesitation, the Carrera kicked over on the first try. Behind us, the 130 hp 1500 Spyder engine with roller crank burst into life, its sound roaring at us through the thinly padded fire wall. We should point out that although this particular car was a factory special—having a 1½ liter Spyder engine and a special close-ratio gear box to fit Targa requirements, Porsche will make 1600 GT Carreras with similar performance for private owners—and with a plain bearing crankshaft. Backing out into the street from the small hotel in Cefalu where the Ferrari and Porsche teams were staying, a crowd of people gathered around to watch us take off up the road. With a shattering roar that drew other townsfolk to their windows, we rocketed away, the noise inside the passenger compartment making us think we were housed in with the engine.

In spite of the noise, it was amazing how untemperamental this Carrera was. It was most docile if one wanted to drive it that way, but we didn't. WHAM, went the throttle to the floor and the rev counter literally soared up to 7000 rpm in second gear. A snap shift into third and we were astounded at the immediate power. Admittedly, the lower ratios were extremely close, with only 700 revs separating them; also helping was the 6:31 final drive gear ratio, but the Spyder engine fitted with the dual throat Webers pro-





Above: At rest on the course the Targa Porsche—except for the numbers—looks like any other "P" wagon. Dog, donkeys, and farmers in the background show some of the problems confronting drivers on race day. Below: Enthusiastic Italians glad hand one of the team cars around a corner during the race. Needless to say, Sicilians love DRIVERS and fast cars.

Above: If any car can be called a dual purpose vehicle it is the Porsche Carrera. It can be driven in town—without developing extra muscles in your shifting arm. The other side of the coin is its ability on the race course. Its performance in competition has to be seen to be believed. Below: Very few 1500 cc cars can live with a Porsche on a tight course.

duced an incredibly clean and crisp acceleration. The gap between third and fourth was exactly 1700 rpm.

The brakes on the Carrera were, surprisingly enough, still quite potent. The shock absorbers were extremely stiff, however, and gave the passengers a jarring ride. Tenacious road-holding gives a driver full confidence in the car. Rear end breakaway as well as wheelspin was easily provoked by mashing the throttle. The gear box was, however, the high point of the machine. Perfect for hill climbs or sprint events, the close ratios do wonders for the performance of the Carrera, and we are of the opinion that this new Type 718 box now in production on all Porsches is the best yet built at Zuffenhausen. More direct and positive than before, the actual shifting effort seems to be markedly less—so great is the self-servo effect.

The engine in the particular car we drove was a 1½ liter Spyder engine comfortably putting out 130 horses. To correct for a peculiar vibration in the engine at certain revs, two distributors had been fitted but not hooked up to both upper camshafts. Another mod to this car was the installation of a 12-volt electrical system for a hotter and better spark at high revs.

Getting off the mark in the competition GT Carrera was much easier than in the de luxe model which we recently tested. This is caused in large part by the 6-31 ratio, but this modification is not recommended by the factory for normal use, due to overloads involved. Nevertheless, the car surged off the mark in smooth fashion, reaching an indicated 110 kph (68 mph) in exactly 11 seconds.

We spent over an hour behind the wheel of this special "Targa" Carrera, roaring about the Madonie mountains, through towns and villages, with people waving and shouting at us enthusiastically. It would not surprise us if future GT Carreras would be the *only* Carreras to be built, with power output closely related to the specs of this particular car. It was one of the most satisfying cars we've ever driven, for it GOES. Many thanks to Huschke von Hanstein for letting us try his special Sicilian bomb; Huschke, when do we get the RSK?


ROAD TEST

# PORSCHE 1600 CARRERA DELUXE


▶ There is absolutely no other 1.6 liter sports car available today that has the performance and comfort of the Porsche Carrera. This figures, since with the exception of the RSK Spyder, the Carrera de luxe is the most expensive model in the Porsche line. Our test car's engine was fitted with a plain bearing crankshaft, one of the latest factory "mods" to these cars (Spyder engines still use the Hirth roller cranks). We put well over 1000 miles on it in all sorts of country, from Mediterranean sea level up to 7000-foot high Alpine passes, only reluctantly returning it to its home at the Porsche factory in Stuttgart-Zuffenhausen.

The first few miles—and thus the first impressions—were gathered on the Autobahn. A surprise was how much quieter this de luxe Carrera is to the charging GT,—for it is definitely meant to be a comfortable, safe, high-speed touring car. The thick sound-proofing material between engine compartment and occupants keeps the noise level down considerably at leisurely cruising speeds, but if one really stands on it, as the revs approach 6000 rpm the Carrera emits a solid full-chested howl. Near maximum speed, the gas pedal picks up an engine vibration that gives your right foot a gentle massage—this is one way to tell when you're flat out!

The de luxe 1600 Carrera comes factory-equipped with a pair of twin choke Solexes (40 PJJ-4) and it was our experience that although the car is not nearly as delicate in cold or hot starts, we found a definite flat spot at low revs when trying to get off the mark. Idle is steady and dead accurate even on a cold engine. After a minute or two the oil temperature rises sufficiently into the green shaded area on the dial to enable one to drive off. Thanks to two oil coolers, one up forward, just behind the front bumper, and one at the rear of the car, the last thing one has to worry about on the Carrera is oil temperature.

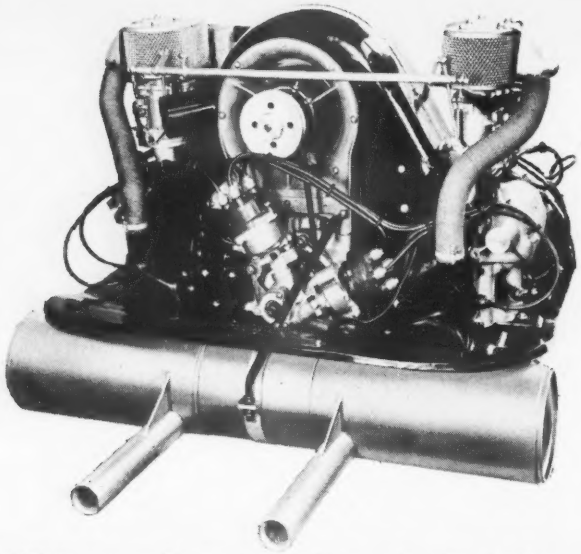
She runs cool all the time, even when being thrashed along flat-out hour after hour. Only after several maximum speed runs did we notice the temperature beginning to rise; also considerable oil had been "squeezed" out of the engine after running at 6800 rpm for several miles. By the end of our trip, we had added exactly three quarts of oil, apparently a good figure judging from the experience of other Carrera owners with whom we talked.

The Carrera engines are built up alongside the Spyder motors in the Porsche racing shop. Actually, there are quite a few items differing between the two types of engines. In addition to the roller crank, RS engines have different shaped pistons and combustion chambers as well as some minor items which spell the difference between the 110 hp and 135 or even 165.

The de luxe Carrera, rated at 105 hp at 6500 rpm is the "cooking" version of the twin cam dry sump racing engine; GT's come through with 110 horses. Due to the fact that all of these engines are individually assembled, each one is giving slightly different performance than the other and as we found out, there are bad and good-running Carreras, even at Zuffenhausen, and in order to make ours go the way we thought it should, we revved the dickens out of it and found it came back for more.

The test car was equipped with the latest Porsche gearbox, Type 716. There have been several alterations to the synchro mechanism so that it is smoother than ever, yet stronger. Very shortly, all Porsches will be delivered with a limited slip differential as well. The new box is standard on all Porsches except convertible "D's" with USA ratios.

Acceleration feel of the 1600 Carrera gets to be impressive only when the revs begin to climb above 4500 rpm—from 5000 to 6000 she moves out from underneath you with considerable steam; in top gear the last 500 revs—up to 7000—come hard. Below 5000 the car accelerates on a

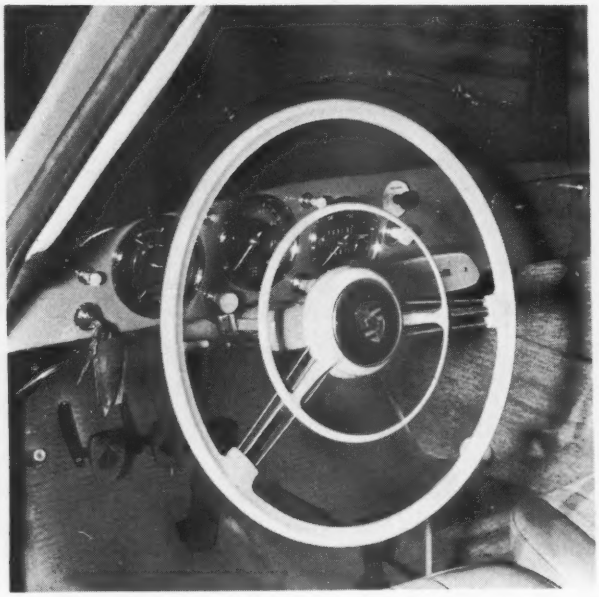


Latest 1600 Carrera engine does away with the noisy roller bearing crankshaft in favor of a plain bearing shaft. External differences are carburetor air heaters, and yet another angle for the distributors. Power? 105 genuine German horses.

par with a well-tuned 1600 Super.

The degree of built-in flexibility is another amazing thing; but something that is getting to be quite common nowadays with high performance machinery. The Carrera can be lugged down to 35 mph in top in complete safety so long as the throttle is not floor-boarded at anything below 2500 rpm. We were a bit disappointed in the maximum speed of the car, for we had been led to believe that all Carreras will top the magic 200 kph figure (124-125 miles) without any trouble. It takes considerable doing to get 125 mph out of one of the latest de luxe Carreras, and it is our opinion that early 356A's are faster than the 1959 cars.

The red area on the rev counter starts at 6000 rpm and in most of our test runs we limited the revs to 6500 through the gears, but then upon returning to the factory we were given a short ride with Huschke von Hanstein, Porsche racing



Porsche interior finish has always been excellent, and that on the new Carrera Deluxe is no exception. Tach red line—at 7500—is indication of performance. Above right: Carrera engine almost impossible to work on when mounted in car.

manager. We complained slightly about the car's performance so all he did was take the revs up much higher than we dared. 7000 rpm in first, and in second and third the needle just went off scale, sailing up to where 8000 should be! Even at unspeakably high revs, we were impressed at the lack of that mechanical banging and chattering that one hears on pushrod Porsches when being overstretched.

We're not recommending Carrera owners to overrev their cars consistently but we only want to make a point that the basic Spyder engine is a mighty rugged piece of machinery and in its "cooking" form the de luxe Carrera is not quite as delicate and hard to keep running right as the earlier versions were.

The car performed extremely well both at sea level and charging up Swiss mountain passes. We did detect a slight lack of performance at 2000 meters above sea level (6500 feet) but this was hardly any surprise. On the return trip as we roared

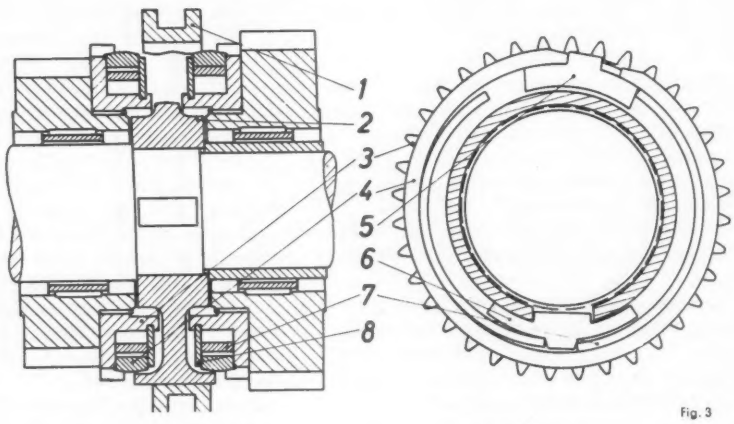



Fig. 3

1 Sliding sleeve
2 Spider
3 Toothed ring on gear
4 Synchronising ring
5 Slider
6 Stop
7 Brake band segment
8 Lock ring

up the final 2 miles of *lacets* on the St. Gotthard at night, we noticed the green oil pressure light winking on hard left hand corners, but as soon as the car was pointed straight again, the light would go off.

The Carrera is great fun to drive in the mountains, first and second gear being well-suited for hard up-hill going. We thought first gear to be a bit too low, for in order to bridge the fairly wide gap adequately between first and second it was necessary to take low gear revs up to 6500 rpm, but after Huschke's demonstration, perhaps it doesn't matter.

Handling and road-holding of our test Carrera was markedly effected by Michelin "X" tires. The "X" is indeed a controversial tire, and let us say right now that with X's fitted to the latest 1600 Porsche 356A one goes around corners as if on a string, and this is no tired simile. The amount of understeer is formidable unless the driver dumps the car violently into a tight corner, and on severely tight hairpins we found it was actually possible to break the front end loose.

From the standpoint of wear, Michelin "X" have no equal, for where 5000 miles on a conventional tire is the absolute maximum, one can expect an easy 3000 additional hard driving miles—8000 miles on a set of tires for a Porsche is long indeed. (Ed. Note: This is under fast European conditions. If you can't afford the trip, visit Mexico.) Rear end breakaway definitely comes at a much later moment and a driver must become accustomed to this before he can drive safely on "X's" under all conditions.

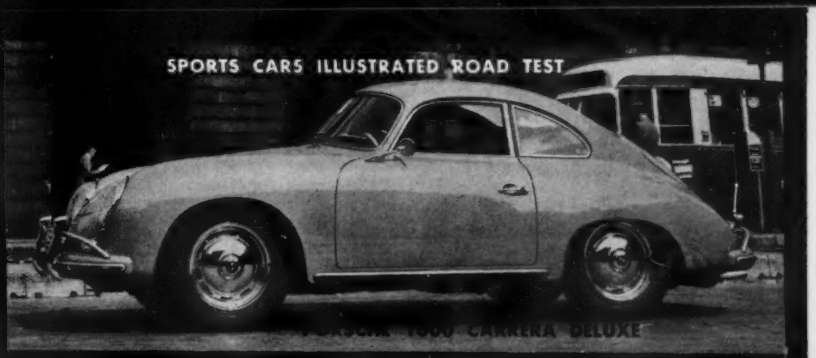
We have nothing but good words to say for the ride of the Carrera; this is due largely to the Koni shock absorbers with which it was fitted. Konis are standard on all Carreras and on other Porsches on request.

Since the normal type of forced air heating does not function efficiently with the 1600 GS motor, all Carreras are equipped with a gasoline heater. The unit seems to be trouble-free, safe and exceedingly efficient, though a slight effect on fuel consumption is to be expected. The unit is fitted in the engine compartment at the extreme rear, further filling the already impressive Carrera engine room.

To work on one of these cars you need the fingers of a professional pickpocket. A 21-gallon fuel tank takes up the better part of the front compartment and leaves only space behind the seats for bags —but as experienced Porsche-pushers know, this always has been the real trunk anyway.

As in any car, the Carrera had its failings—most troublesome was its inability to get off the mark smartly without slipping the clutch. Apart from this, we enjoyed driving the car tremendously; she'll cruise all day long at 100 mph and is equally at home in the midst of city traffic. With the Carrera's flexibility in the gears, one is able to overtake or to shoot through narrow gaps almost at will—all in all a very satisfying car to drive.

*—jla*





**TOP SPEED:**
Two-way average .....118 mph

**ACCELERATION:**

| From zero to | seconds |
|---|---|
| 30 mph | 3.8 |
| 40 mph | 6.2 |
| 50 mph | 8.2 |
| 60 mph | 10.8 |
| 70 mph | 14.4 |
| 80 mph | 17.7 |
| 90 mph | 22.8 |
| 100 mph | 28.4 |
| Standing ¼ mile | 18.4 |
| Speed at end of quarter | 82 mph |

**SPEED RANGES IN GEARS:**
I— 0- 35 .....(6500 rpm)
II—18- 60 .....(7000 rpm)
III—25- 88 .....(7000 rpm)
IV—35-118 .....(6800 rpm)

**FUEL CONSUMPTION:**
16½-23 mpg

**POWER UNIT:**
Type .....Air-cooled, flat four
Valve Operation.....Dohc, shaft driven
Bore & Stroke.....3.44x2.60 in (87.5x66 mm)
Stroke/Bore Ratio .....0.75/1
Displacement..96.8 cu in (1588 cc)
Compression Ratio .....9.0/1
Carburetion by....Two Solex 40 PJJ —4 twin-chokes
Max. Power....105 ps @ 6500 rpm
Max. Torque.....89 lbs-ft @ 5000 rpm
Idle Speed .....1000 rpm

**DRIVE TRAIN:**

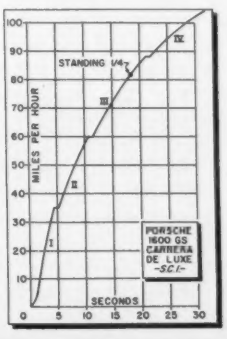
| Transmission ratios test car | overall ratio |
|---|---|
| I—3.09 | (13.79) |
| II—1.94 | ( 8.58) |
| III—1.35 | ( 5.93) |
| IV—0.96 | ( 4.25) |

Final drive ratio—4.43 (no other available)

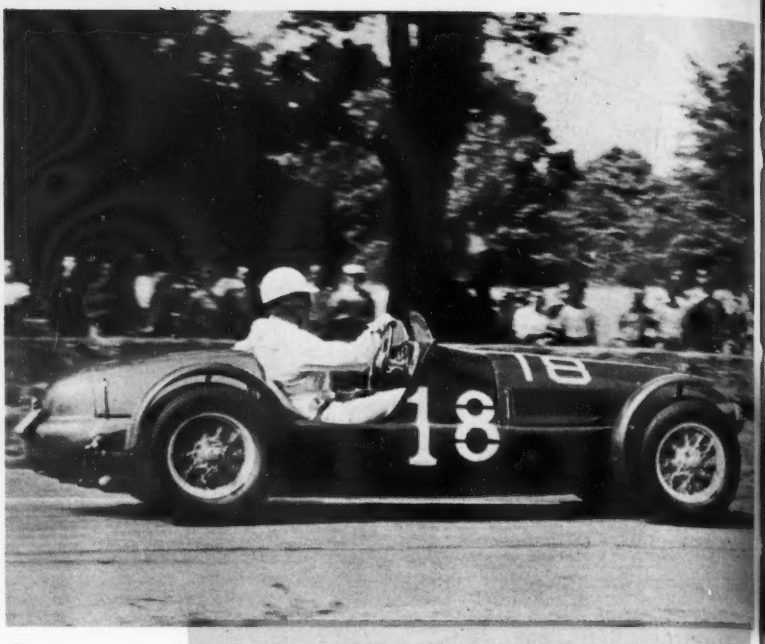
**CHASSIS:**
Frame....Welded sheet-steel punt
Wheelbase .....83 in
Tread, front and rear..51½, 50 in
Front Suspension.....Ind., trailing arms, torsion bars, and anti-roll bar
Rear Suspension.....Ind., swing axles, trailing arms, torsion bars
Shock absorbers....Koni telescopic
Steering type..2F worm and sector
Steering wheel turns L to L.....2½
Turning diameter, curb to curb 36 ft
Brakes.....11 in bimetallic drums
Brake lining area.....122 sq in
Tire size .....5.90x15

**GENERAL:**
Length .....156 in
Width .....65½ in
Height .....51½ in
Weight, curb (¼ tank)....2100 lbs
Weight, as tested (one up) 2240 lbs
Weight distribution, F/R as tested.....58.6/41.4
Fuel capacity .....21 U.S. gallons

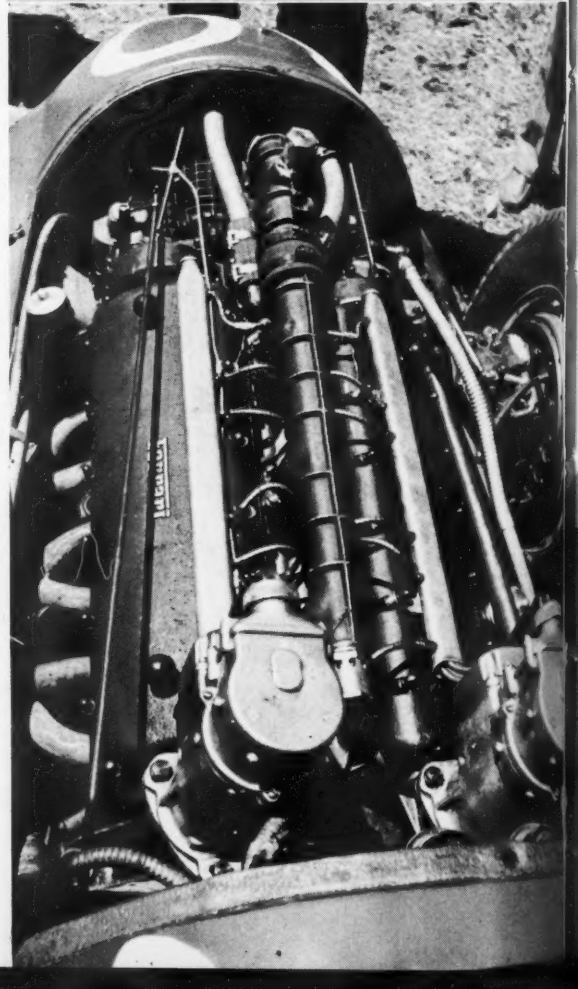
**RATING FACTORS:**
Specific Power Output 1.09 ps/cu in
Power to Weight Ratio, as tested .....21.3 lbs/hp
Piston speed @ 60 mph 1500 ft/min
Braking Area, as tested 109 sq in/ton
Speed @ 1000 rpm in top gear .....17.3 mph



# TWELVE YEARS WITH TWELVE CYLINDERS



**The U.S.'s first Ferrari was Briggs Cunningham's two-liter Type 166, seen above at Bridgehampton, 1949. Below, the 1½-liter F-1 engine of the same year was supercharged. The ultimate version put out over 300bhp, which has now been equaled by its unblown descendent, the three-liter 250 Testa Rossa. Components of the milder GT engine are shown at right: the unusual hairpin valve spring, a partially finished connecting rod (held by Phil Hill), a crankshaft being machined from steel bar stock, a cylinder head showing the six highly polished combustion chambers, a pair of aluminum crankcases seen from below, a completed crankshaft, machined all over, and finally, another view of the aluminum head showing intake ports and the pedestals which hold the rockers.**



***By Stephen F. Wilder***

► Upon first peering under a Ferrari hood at its glistening V-12 engine, a Californian was heard to say, "Gee, can you get any speed equipment for it?"

We used to laugh and laugh over this, but the more we learn about Enzo Ferrari and his bagful of bores and strokes, the more we sense a nugget of innocent wisdom in this question.

The fact is, you *can* get speed equipment, only the Italians eschew such a non-esoteric term. They offer instead a variety of types and models. The prolific Ferrari family includes small twelves, big twelves, in-line fours of all sizes, fours stretched out into sixes and, since the Jano-designed Lancia V-8 branch was grafted onto the family tree, both V-8's and V-6's. And each one seems to come in several versions—hot, hotter, and factory-prepared.

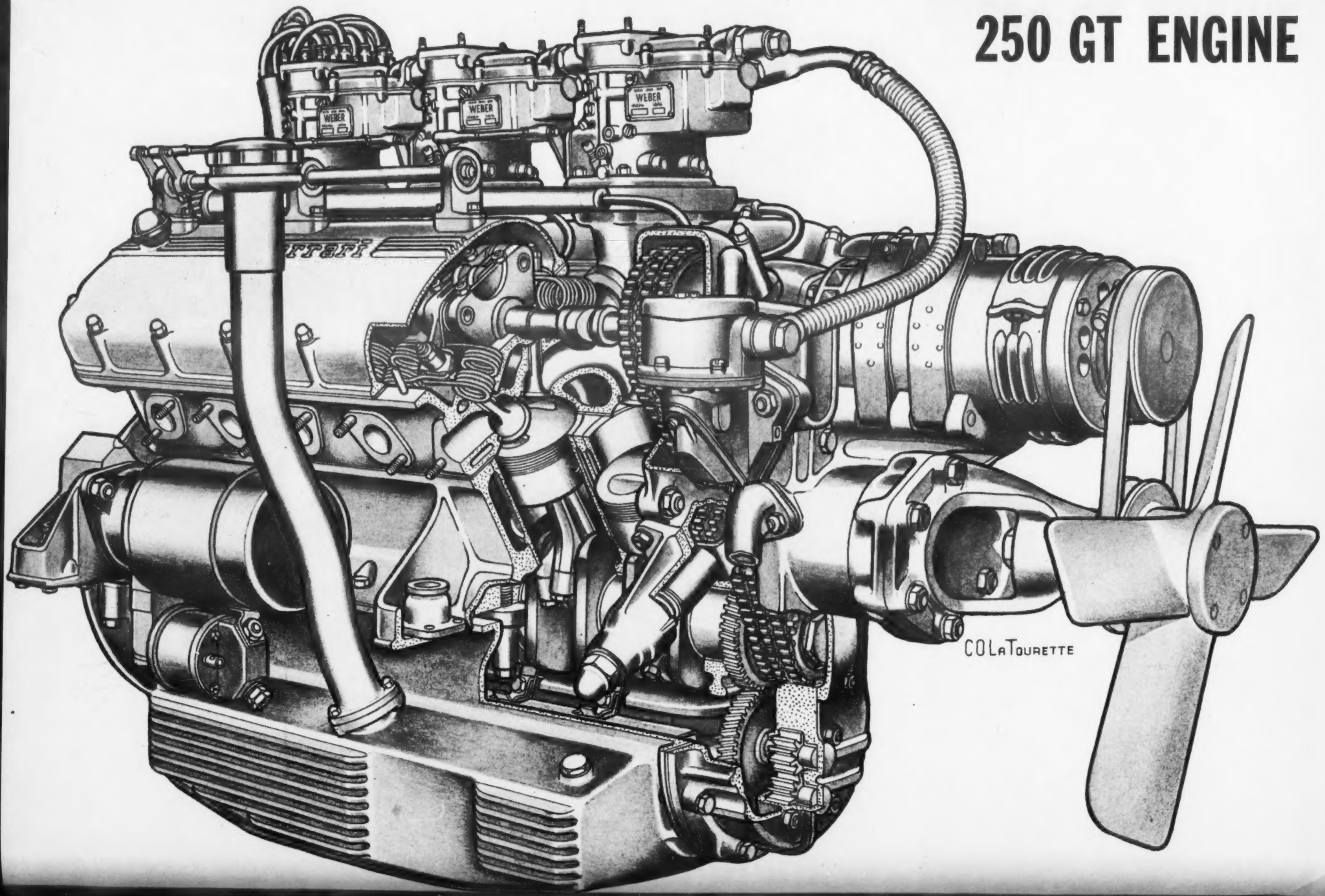
Strangely, the two progenitors of this varied clan were two separate straight-eights, both built before World War II. One wore the name and crest of Ferrari, the other, more important to our story, did not.

When Scuderia Ferrari lost its "exclusive franchise" to race Alfa-Romeos, the Commendatore commenced building his own cars for competition. With the help of an Italian speed merchant named Nardi, two Fiat four-cylinder engines were joined end-to-end in time for the 1940 Mille Miglia. It didn't work too well and the project was dropped with the spread of the war. What *was* surprising was the source of engine power. The core of Enzo's argument which led to his break with Alfa was that the factory couldn't prove anything by building racing-cars based on production parts. Once he'd left, the Milano factory evidently saw the wisdom of his belief, relying thenceforth on the very non-production Type 158's (See SCI, Feb. '58).

Having proven himself right, or wrong, depending on how you look at it, at his own expense with his 8C1500, Enzo had the whole war to ruminate upon it. When it was over, he drew again on his Alfa-Romeo experience by hiring Gioacchino Colombo to design an all-new Ferrari engine. Aim? To beat the Alfa-Romeos

*(Text continued on page 52. Cutaway drawing and technical description on following pages.)*

# 250 GT ENGINE



TECHNICAL DESCRIPTION

For all its fabulous reputation and the

## TECHNICAL DESCRIPTION

For all its fabulous reputation and the aura of mystery which surrounds it, the layout of the single-cam Ferrari vee-type engines is quite orthodox by today's standards. Twelve years ago, though, it created quite a stir.

The siluminum (silicon-aluminum alloy) crankcase, carrying two banks of six cylinders at 60°, is split at the crankshaft centerline. A large water gallery, filled by a front-mounted centrifugal pump, runs down the crotch of the crankcase. Small openings in the water jackets limit the flow around the wet cylinder liners. Water then passes into the cylinder heads, where it can circulate entirely around the exhaust valve guides.

The gear-type oil pump is driven off the bottom of the crankshaft nose. The main oil gallery is also in the crankcase vee, directly below the one for water. Originally, the cranks' main bearings only were fed through this gallery, the big ends being supplied separately. Now the crank is drilled in the conventional manner, with each big end being fed by the nearest main bearing.

There are seven main bearings in all, one on each side of the six throws of the machined-from-bar crankshaft.

The big ends of the paired connecting rods are split diagonally. This permits them to be pulled up through the small cylinders. Despite the 33% bore increase, this feature is still necessary. Wrist-pins are full-floating, circlips having replaced the original design's end bushes for location.

The cylinder liners are clamped in place by the head, with individual copper fire-rings interposed. The liners are supported near their bottom by flanges. Here metal-to-metal joints of extreme smoothness and precision are relied upon to separate the water and the oil.

The domed pistons are of aluminum, naturally. At top dead center, they nestle snugly under the modified hemispherical combustion chambers to give a compression ratio of 9.57 to 1. The chamber's surface is based on two spheres, each one centered about a valve stem. The intakes are offset from the cylinder center line, encouraging turbulence and (except on the T-R) providing more room for the spark plugs.

The heads are laid out symmetrically in the transverse plane with the valves at 45° and 45°. To further simplify machining, the flange faces of the ports are perpendicular to the head surface. Ordinarily, the wide ange of the valves would tend to discourage the use of only a single overhead cam. But in the case of the Ferrari, short and therefore light rockers are feasible because the valve springs are of the hairpin type.

With these, a compact arrangement is achieved with a low rate, high pre-load spring which gives a more nearly constant closing load on the short valve. With ordinary coiled springs of sufficient stiffness to permit the same peak revs, not only would the taller springs require longer rockers and valve stems, but the peak loads on the nose of the cam lobes would cause a serious erosion problem. As it was, the radiused surface on the follower end of the rocker has been superseded by a roller follower of the same radius. This particular problem (which caused so much grief in Detroit) may have been expected by Colombo, as the roller follower arrangement looks as if it had been part of the original layout.

On the other hand, roller followers were used from the beginning on the Lampredi twelves and only appeared on the small series long after Colombo had moved to Bugatti.

The camshafts themselves are driven by a single-stage, triple-roller chain. Because of the short stroke, a two-stage set-up is avoidable without excessive noise. However, the idle of any well-muffled V-12 brings to mind the early Manneygram, "the world's fastest revving sewing machine".

The three current 250 series engines have different valve timings as noted:

| (Degrees) | T-R | GT Berl. | GT Coupe |
|---|---|---|---|
| INTAKE: | | | |
| Opens BTDC | 43 | 42 | 27 |
| Closes ABDC | 75 | 72 | 69 |
| Duration | 298 | 294 | 276 |
| Lift (in.) | .398 | .398 | .354 |
| EXHAUST: | | | |
| Opens BBDC | 70 | 70 | 73 |
| Closes ATDC | 40 | 40 | 17 |
| Duration | 290 | 290 | 270 |
| Lift (in.) | .394 | .394 | .354 |
| Overlap | 83 | 82 | 44 |

Covering the valve gear are the traditional black crackle cam covers with the name Ferrari cast in. Incidentally, the covers are not held down by those two round, black knobs; they're only for pulling them off once the sixteen little nuts around the edge have been undone.

Between the handsome covers pose the V-12's crown jewels—its Weber carburetors. The Testa Rossa uses six, and the GT Coupe uses three of the twin-choke 38 DCL3 type. America-destined versions of the Berlinetta engine (available in the California roadster incidentally) also come with three of these, but data from Europe indicate that domestic versions carry three Weber quads, Type 38 IF.

Though this provides twelve choke tubes for the twelve cylinders, it hardly eliminates unequal pulsations as the manifolds and ports are still siamezed. With the nearly T-R cam, at least greater capacity is available. The proof lies in the dyno reading: 267 hp @ 7000 vs. 240 @ 6800.

A feature which tends to exaggerate the variety of Ferrari V-12's is the arrangement and location of the distributor(s).

These Marelli devices have been tried at both ends of the camshafts, extending horizontally, upright and both singly and in pairs. Except for the second series Type 125 Grand Prix engine, the Colombo twelve has had only single ignition.

To a certain extent, the extensive variety may be credited to experimentation, but more cynical observers attribute it partly to what's available from Marelli.

The big series of V-12's is only in some respects a scaled-up version of Colombo's design. Its crankcase presents some typical Lampredi features which are found in all of his subsequent in-line designs. Most important is that the cylinder liners screw into the head, being then clamped into the crankcase as before. This necessitated several detail changes on head, liner and crankcase, but on the outside the easiest way to distinguish the "littles" from the "bigs" is to count the number of hold down studs on the camshaft covers — sixteen and eighteen respectively.

Judging from the bore and stroke of the 130 S 56, it would seem that the four-cam series which owes so much to the Jano design of the Lancia V-8 shares at least the cylinder spacing of the Lampredi series.

| Years Built | Engine Type | Car Name, and Number if different | Bore (millimeters) | Stroke | Disp. (cc) | Quoted Power |
|---|---|---|---|---|---|---|
| | | **COLOMBO series:** | | | | |
| 47-48 | 125 | Sports, Competition | 55 | x 52.5 | 1497 | 72-118 |
| 47 | 159 | "Pescara" | | approx. | 1900 | ? |
| 47-50 | 166 | Inter, Mille Miglia, Formula B, F-2 | 60 | x 58.8 | 1995 | 110-160 |
| 48-49 | 1500 | Formula One (s/c) | 55 | x 52.5 | 1497 | 225-230 |
| 49-50 | 1500 | F-1, 4 cams (s/c) | 55 | x 52.5 | 1497 | 280-300 |
| 49-50 | 195 | Inter | 65 | x 58.8 | 2341 | 130 |
| 50-53 | 212 | Inter, Export | 68 | x 58.8 | 2563 | 150-170 |
| 51 | 166 | Formula Libre (s/c) | 60 | x 58.8 | 1995 | 310-315 |
| 51 | 166 | Formula Two, 4 cams | 63.5 | x 52.5 | 1995 | 160 |
| 51 | 225 | Sports | 70 | x 58.8 | 2715 | 200-210 |
| 52, 54-59 | 250 | Europa, Mille Miglia, Gran Turismo | 73 | x 58.8 | 2953 | 220-267 |
| 58-59 | 250TR | Testa Rossa (six-port head) | 73 | x 58.8 | 2953 | 300-306 |
| | | **LAMPREDI series:** | | | | |
| 50 | 275 | Sports, Formula One | 72 | x 68 | 3322 | 270-300 |
| 50, 51-52 | 340 | Sports, Formula One 342 America, Mexico | 80 | x 68 | 4102 | 200-350 |
| 50-54 | 375 | Formula One(50-52) Sports (53-54) | 80 | x 74.5 | 4494 | 330-380 |
| 54-59 | 410 | Super America, Superfast | 88 | x 68 | 4962 | 340-400 |
| 54 | 250 | Indianapolis (s/c) | 68 | x 68 | 2963 | 510 |
| 54 | 103 | 250 Europa | 68 | x 68 | 2963 | 200 |
| 54-55 | 104 | 375 America, 375 Mille Miglia | 84 | x 68 | 4523 | 300-340 |
| 55 | 113 plus | (not used) | 84 | x 74.5 | 4954 | 330 |
| 56 | 130 S 56 | 290 Mille Miglia | 73 | x 69.5 | 3491 | 300 |
| | | **FOUR-CAM series:** | | | | |
| 57 | "3.5" | 290 Mille Miglia | 73 | x 69.5 | 3491 | 350 |
| 57 | "3.8" | 315 Mille Miglia | 76 | x 69.5 | 3783 | 380 |
| 57 | 412MI | "4.1" (closer to 4.0) | 77 | x 72 | 4023 | 400-447 |
| 57 | 312LM | (not used) | 73 | x 58.8 | 2953 | 356 |

Ferrari couldn't have hired a better man for it was Colombo himself who designed the Alfa Type 158's power plant, the other straight-eight mentioned before. Colombo was a specialist in the many-small-cylinders school of design, having also done a never-used, 1½-liter flat-twelve for Alfa before the war.

Under Ferrari's chief engineer Luigi Bazzi, Ing. Colombo created a 1½-liter, 12-cylinder engine arranged in a 60° V with a single overhead camshaft per bank.

The Type 125 was laid out in three versions. Horsepower outputs ranged from a measley 75 at 5400 rpm for the "sports" to a more reasonable 118 at 6800 for the "competition". However, the single-stage, Roots-supercharged F-1 version for GP single-seaters put out a striking 225 hp at 7500 rpm.

Its type number indicated the number of cubic centimeters per cylinder, a system maintained (with some inaccuracy) on all succeeding models until 1954. It is still used for car type designations today.

Keeping track of *les affaires* Ferrari is difficult at best. For one thing, there is none too clear a distinction between what *Ferrari Automobili* build for the public and what they build for the *Scuderia*.

Records are sparse but we suspect that few of the unsupercharged Type 125's were actually produced. In 1947, (the same year, incidentally, in which the first MG TC's arrived in America) a bored and stroked version, the Type 166 appeared in sports car racing. First win was Raymond Sommer's at Turin.

A year later Ferrari issued a catalog (what a collector's item that must be) showing both the 166 Inter and the 166 Mille Miglia. A still hotter engine was also available in a single-seater Grand Prix chassis for Formula B. More popular though was the cycle-fendered two-seater. It could be raced as a sports car with the fenders or as a Formula B car without them. A real dual-purpose sports car.

1948 saw several Ferrari successes with these cars but everyone, including the Commendatore himself was anxiously awaiting the Formula One car with its Roots blower. Being more complicated, it was coming along more slowly.

Finally, near the end of the season, three of them appeared at the Grand Prix of Italy at Turin. Only one finished, Sommer being third behind Wimille's Alfa and Villoresi's Maserati. Not bad for a beginning, but Sommer had also managed a third at Geneva with the unblown 2.0 liter single-seater earlier in the year. Two more races at Monza and Barcelona showed that while the new Ferraris could outdistance the old Maseratis, the Type 158 Alfas had a big head start even if Ferrari did have their old designer.

In 1949 the *Alfa Corse* did no racing and *Scuderia Ferrari* had a fine year. Good but not superlative, so Colombo took the Formula engine back to the drawing boards to prepare for the future. The result was twice as many cams and superchargers and a peak output of 280 hp at 7500 rpm. (Some say 310 or more.) It led from start to finish its first race out (Monza) but when *Alfa Corse* got back into the fray in 1950, it was obvious they hadn't been asleep either.

Finding himself still out-classed, Ferrari hired Aurelio Lampredi to design a brand new engine to the 4½ liter unsupercharged side of the GP formula. It started out at only 3.3 liters but after a pause at 4.1, it reached the 4.5 limit before the 1950 season was over. These cars so dominated Formula One that with Alfa's retirement after the 1951 season, everyone else lost interest and the Formula withered away.

The large engine's advantage was that with the new knowledge about normal aspiration (See SCI, July-September 1957, Whence Come the Horses?) it was possible to equal the output of smaller blown engines without suffering the extravagant fuel consumption. Fewer refueling stops meant more wins and so the 1½-liter Grand Prix engine was laid to rest.

But not forgotten. In both its F-1 form and in the two-liter supercharged form (built especially for the then popular Formula Libre races) it had been proved that this Colombo design was strong enough to transmit over 300 horsepower to the flywheel.

The exploitation of this took till 1958, many years more than really necessary. Unlike many racing engine conversions, this one has been tamed without sapping its vitality.

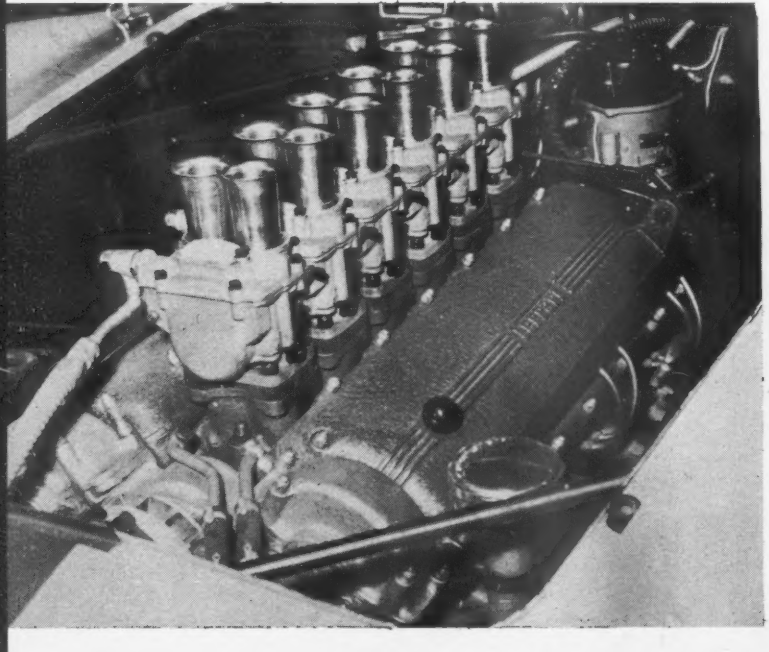
The path was one of adding inches and improving breathing capacities. This is familiar to those who've hopped up production touring car engines, but it is not usually easy to perform on racing engines.

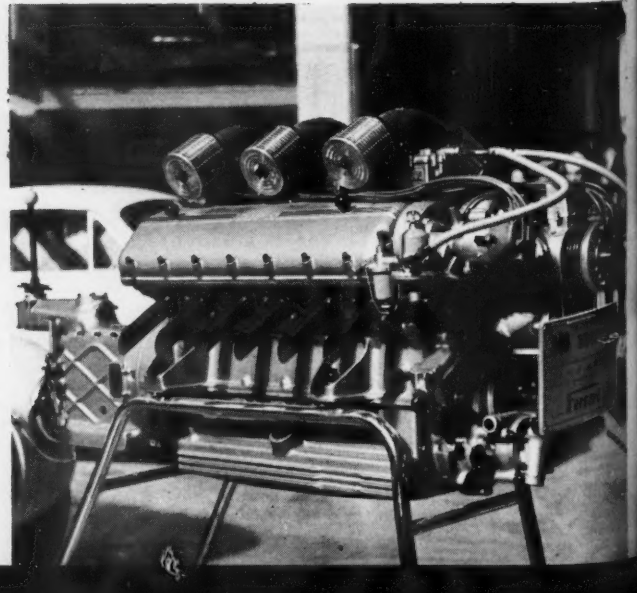
The first documented step was taken in creating the Type 166. It was nothing more than a Type 125 with 5mm more bore and 6.3mm more stroke (60 x 58.8 mm or 2.36 x 2.32 in.) This new stroke has never again been increased. Any Ferrari V-12's with a larger stroke than this are based on the Lampredi-designed "big twelve".

The 58.8 mm limit on the stroke is interesting since the cylinder spacing, center to center is the more obvious limitation to displacement growth as it determines how much the bore can be increased. But more important here is the Colombo V-12's narrow crankcase which quickly ran out of spare clearance for the con rod big ends.

The Type 166 sufficed for sports cars until 1949, as the F-1 engines were getting the major attention. That year the Type 195 appeared with a 65 mm bore. Each succeeding year the bore was further increased, stopping finally at 73 mm for a displacement of 2953 cc in 1952

Fitting Formula 2 perfectly, the Type 166 endured longer in racing than in sports cars. As that formula become more competitive, a final version was built out of a late four-cam 1500 F-1 engine. Without the blower, but using the 52.5 mm stroke, it had a 63.5 mm bore to bring it up to the familiar 1995 cc size. With only 160 hp, it was no better than the single cam version and lost out to Lampredi's 185 hp four-cylinder design.





**Left is the 250 Testa Rossa engine. With its six twin-choke Weber carbs and the special heads with individual ports, it develops 306 bhp at 7400 rpm, about the same as the supercharged, small displacement racing version of ten years previous. Below is the outwardly similar but inwardly different engine designed by Lampredi. It ranges from three to five liters, while the Colombo design runs from one and one-half to three. Fast identification trick: count cam cover's hold down studs.**

After 1953, the *piccolo dodici* was temporarily shelved. All cars, production and racing, were based on Lampredi engines. The smallest V-12 available was the misleadingly named Type 250 Europa which had the comparatively small bore of 68 mm, equal to the stroke. Not to be confused with either earlier or later Type 250's, it was probably built on the Lampredi crankcase to simplify production at slight cost of weight and size. But what confusion to students and mechanics alike.

Easier to justify from an engineering point of view was its supercharged version, the Type 250 Indianapolis which developed a cracking 510 hp at 7000.

To really confound matters, in mid-54 it was decided to build a series of 100 Gran Turismo cars to qualify for FIA homologation and win back some of the prestige being stolen by Daimler-Benz. Since they would have to win competitive events as well, the lighter, more compact Colombo V-12 was revived in a slightly detuned version of the Type 250 Mille Miglia and called, of all things, the Type 250 Europa. The only reason we can think of for this confusing step was to kid the FIA into thinking the new and the old Europas were one and the same, the earlier to meet the quota of 100 cars constructed. With minor tuning mods, this engine (and car) has continued in production right up to the present, though the name was changed to Gran Turismo after homologation.

From 1954 on, the only other V-12's being built were the 4.5 and 4.9 Lampredi models. The latter too is still in production, but only on a very limited basis (approximately 20 cars per year).

Lampredi then concentrated on a series of in-line competition engines of four and six cylinders. The improvement in low speed torque with them led to an F-1 vertical twin (118 x 114 mm, 2493 cc) which developed 174 hp at 4800 rpm before shaking itself and the test bed apart. This extravagant experiment led, it is rumored, to Ing. Lampredi seeking employment elsewhere. Perhaps the long string of Mercedes victories had something to do with it, too.

In late 1955, Scuderia Ferrari took over the operation and development of the Lancia V-8 cars designed by Jano. This was the first time since the days with Alfa-Romeo that they had raced cars not of their own manufacture. Purists referred to them as Lancia-Ferraris to the end of their useful racing life, though by then only the basic layout remained original.

Once this project had been thoroughly digested, Ing. Chiti began to create new engines. This he did by judiciously combining various features of the well-proven Colombo, Lampredi and Jano designs which preceded them.

Completing the V-12 picture is the four-cam series introduced in 1957. First was the 3.5-liter Type 290 Mille Miglia which as early as Sebring that year had grown to 3.8 liters. Completing this group is a 4023 cc version known as the 4.1. The reuse of this designation, once coupled to the type name America reminds us that this is about the only place where such large sports cars are still welcome.

To prepare for the 3-liter limit which commenced in 1958, a model of this four-cam engine was built using the same bore and stroke as the Type 250 GT. After tests, this Type 312 LM engine was abandoned in favor of a highly developed version of the Colombo design. Ing. Chiti concluded that for sports car racing engines at least, double overhead cam arrangements were not worthwhile at three liters or less, especially since the four-cam was big enough for four-liters. It was heavier, more expensive and less reliable than the tried and tested expansion of Colombo's old design.

This new engine was placed in a modified version of the Testa Rossa chassis, which in 2 or 2½-liter form had proved itelf to be the best handling Ferrari ever. The car had been named after its four-cylinder engine and now the new engine was named Type 250 Testa Rossa after the car.

For this project completely new heads were made, finally providing what many thought should have been there all the time—separate intake ports for each cylinder. Space requirements then dictated that the spark plugs be moved outboard. Handsomely equipped with six twin-choke Weber 38 DCM carburetors, all in a row, the new 250 Testa Rossa achieved 300 hp at 7200 rpm in 1958 and handily brought Ferrari the sports car manufacturer's championship.

This year the output is rated at 306 hp at 7400 rpm and the cars are available to private competitors.

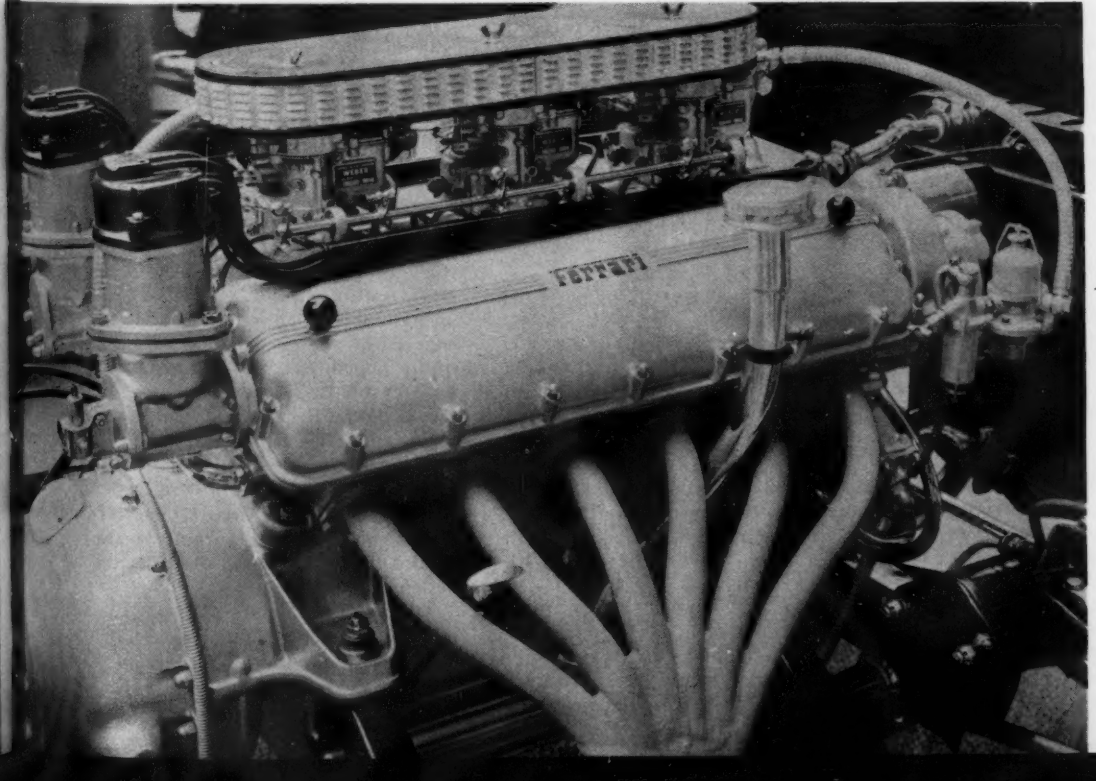
In the competition department, the emphasis today is on V-6 engines. Chiti has created two separate "Dino" series, so-named in memory of the Commendatore's son. Like the Type 312 LM mentioned above, they use a new numbering system. The last digit (or two) tell how many cylinders, while the first one or two tell how many liters. For instance, the first V-6 of 1½ liters was called the Dino 156.

Better known at the moment are the four-cam racing engines. Here the angle of the vee is 65° (five more than desired for the best balance) in order to provide more room for carburetors between the banks. Otherwise, like the latest V-12's, they are logical developments from the ex-Lancia engines.

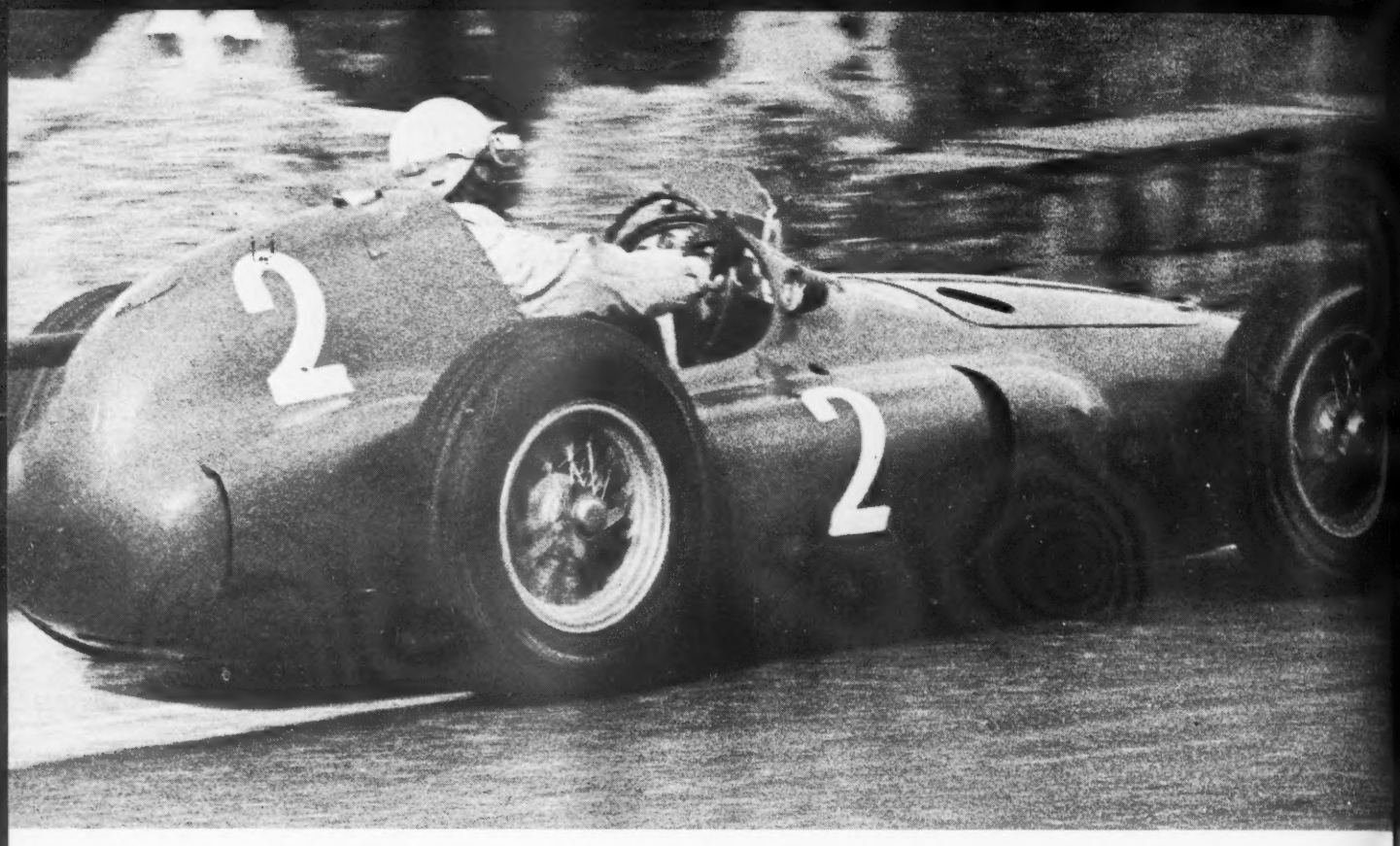
Planned for imminent production is the two-liter sports Dino. It bears little resemblance to the Formula One engines of the same name. The angle of the vee is exactly 60° for one thing. For another, single overhead cams per bank are used. Essentially this would seem to be a Type 250 sawed in two, although due to the reduced loads, the cams are driven by only a double-roller chain.

Having improved the first 250 GT's (then known as Europas) in answer to the Mercedes 300SL, perhaps now Ferrari is preparing to meet the challenge from the other side of Stuttgart. Whatever occurs, we can remain assured that Ferrari engine design is unlikely to stagnate.

*—sfw*




**Handsome is as handsome does. The splendid finish of the 250 GT engine in this show chassis is little if any better than that of a car just off the production line.**



► For a wide variety of reasons the so-called Squalo and Supersqualo Ferrari Grand Prix cars are among the most fascinating machines ever to emerge from the Maranello workshops. In a real sense they represent the final flowering of the line of development in racing cars that Ferrari himself had chosen as most desirable. They therefore reflected the Commendatore's philosophy of racing. Specifically, their lineage stemmed from the first fours of mid-1951 and was terminated during the winter of 1955-56, when Ferrari decided to base his future efforts on the Lancia V8 cars which had been given to him. Every subsequent Ferrari Grand Prix car has been deeply influenced by the Lancias and by Vittorio Jano, who was brought into the Ferrari camp with the cars.

In a beclouded way, as will be seen, the Squalos were also the last expression of the racing design ideas of Aurelio Lampredi, and will probably remain such until Fiat decides to go racing once again. These cars were also provocative by virtue of their rakish appearance, which balanced a high, stumpy tail against a low, sharp snout with the wide swellings of the side fuel tanks in between. Ferrari indulged in a certain amount of styling on these cars, especially on the 1955 version which had Scaglietti bodywork instead of the factory shells fitted in '54. Most significant technically were the 1954 Squalos, which were rife with departures from previous practice—some successful, some not—which lapsed in the 1955 edition but have reappeared in the Dinos, making one wonder about racing progress.

Taken overall the story of the Squalos is a typical history of a Grand Prix Ferrari, typical because it's fraught with inconsistency, stubbornness, backward steps, personality factors, financial problems, artificial crises—the whole confusing gamut that makes one wonder how they ever have time to build cars in Italy. They do, though, and fine ones at that.

A chaos of rumor and doubt enveloped the first appearance of the type at Monza for the Italian G.P. in the fall of 1953. Ferrari had announced one of his periodic retirements from racing and there was much speculation as to the fate of the two brand-new cars that had finally appeared after months of reports of new car from Maranello, most of them stressing extreme small size and the possibility of a six-cylinder engine. They materialized at the Monza track for testing during the week before the race, where Ascara found that they couldn't yet equal the times put up by the "old reliable" high-chassis Formula II car, partially because of a tendency to "wander" at high speeds. Both cars did compete in the race in order to collect a $11,500 prize for an Italian manufacturer who entered two prototypes in the event, while Maglioli slid into eighth place to annex $16,000 more for being the first new car to finish.

To suit the Formula II limitation then in effect, the engine measured 93 x 73.5 mm and was type-named the 553F2. The "553" portion was applied to the basically identical but larger 1954 engine, and eventually came to refer to the whole car, though this isn't strictly correct. In two-liter form induction was through 52-DCOA3W Webers, and the exhaust piping was visibly smaller than the early '54 layout. These passed enough air to give 150 bhp at 5000 rpm, 180 at 6500 (the strict rev limit imposed during the race, to ensure that $16,000 being collected at the finish) and a maximum of 190 at 7200 revs. Another variation from the later layout was the mounting of the oil tank and small fuel tank low down behind the rear gearbox, bringing about a long, slim tail shape with a not particularly attractive air vent hole at its tip.

About two weeks after Monza some serious testing was seen in progress along the Maranello-Modena highway, indicating that Ferrari would be in business in 1954. The first entry in the new year was at Syracuse and was disastrous, Farina wrecked his engine and Gonzalez crashing and burning. Ferrari took a bit of time out after that to lick his wounds, which we can put to good use to examine the Squalo of 1954.

Apparently happy with the four-cylinder idea, which was in line with Ferrari's desire for simple, raceable cars, Lampredi went ahead with a much-modified version of his completely successful Formula II fours. He hoped that the new engine would be able to run reliably at high revs—the immediate goal was 7500—and that the top end could breathe well enough to be useful at this speed, both desires leading to grossly oversquare dimensions of 100 x 79.5 mm, for a displacement of 2496 cc. To get a perspective on this rpm goal, let's consider Lampredi's 90 x 78 mm Formula II four of 1953, which was reliable at 7500. This corresponds to a mean piston speed of 3850 feet per minute, which when corrected for bore size by dividing by the square root of the stroke/bore ratio is actually 4140 fpm. With similar standards of structural design the 553 engine could be expected to be trouble-free at 7050 rpm only, so some kind of breakthrough in Lampredi's thinking was obviously going to be required for the desired revolutions to be reached. Looking at it from another direction the more recent BRM engine of 102.9 x 74.9 mm is quite dependable at 8100 rpm, which equates to a corrected piston speed of 4670 feet per minute. This high figure requires exceptionally good piston design and such unusual bottom end features as four-bolt rod big-ends and laterally braced main bearing caps. These were apparently not in the good Aurelio's working vocabulary, he not being renowned for his crankcase designs.

As in the Lampredi V12's the cylinder head and water jacketing of the 553 are cast of silumin alloy in one piece which includes the entire cam drive gear casing at the front. Cast iron cylinder liners are

# THE LAST OF THE REAL FERRARIS

*by Karl Ludvigsen*

screwed up into the combustion chambers, and hang down below the bottom edge of the water jacketing. When the head/jacket unit is bolted down to the deep crankcase these liners are made water-tight with the latter by a close fit plus rubber O-rings. On all the various modifications of this engine – Monza, two-liter Testa Rossa, certain 1954 G.P. variants – this head casting is high enough to allow it to be held to the crankcase by studs all around its base, but on the pure Squalo engine only height had been reduced to the absolute minimum, leaving no space for these studs or their nuts. The head assembly is thus retained by four studs at the corners of the crankcase, and by eight long studs emerging between the cam boxes in the center of the engine.

About half the height of the entire engine, the light alloy crankcase is notable for its smooth, unribbed sides and considerable width. It carries the crankshaft in five main bearings, Vandervell thin-wall shells being used exclusively. Finished all over, the deep-throated rods are conventional in layout, while the pistons probably resemble those of the Monza, which had full skirts carrying one of the four rings below the wrist pin. At the bottom the crankcase sides curved inward to a very shallow finned oil pan which lacked the convolutions of the sports Ferrari fours.

Like today's Dino engine, the type 553 housed many of its accessories in a cover plate bolted to the front of the crankcase. The scavenge and pressure pumps for the dry sump oiling system are at the lower right and left of the cover, and between them and a bit higher—just below the crank centerline – is the usual Fimac mechanical fuel pump. At the upper left and right of the cover, at both sides of the crank nose, are the two Marelli magnetos which rest horizontally pointing forward. Driven from a bevel gear above and between the mags is the horizontally-placed water pump with double outlets. These deliver cool water to the engine through the center of the side of the crankcase, thus near the heavily-loaded center main bearing, whence it flows upward to emerge from risers cast above the center of each combustion chamber and return to the radiator through a manifold.

A narrow gear train rose fom the crank nose to drive the twin camshafts. Since the head/water jacket casting was so short, the highest central gear protruded up above the central valley of the head much farther than in any other of the fours. Though not fitted in 1953, it was found necessary in '54 to install small external oil pumps to feed oil to the bearings of these drive gears; a fracture, probably from vibration, of the feed to this piping led to Gonzalez' retirement in the French G.P. in 1954.

Carried in five bearings in detachable tappet boxes, the large-diameter camshafts are hollow, the left-hand or exhaust cam also driving the tachometer from its back end. The 553's valve gear is extremely interesting, being a development of the gear used with satisfaction in the Formula II engines. The narrow cam lobe attacked a roller, which was shaft-mounted in the upper face of a wide aluminum mushroom tappet. In earlier designs two thin-wire coil springs were used to hold the tappet assembly against the cam, but in the Squalo a single heavy spring exerting about 125 pounds compressed was fitted. In the hollow stem of the mushroom is inserted a shouldered steel plug which comes from the machine shop unfinished at the tip which contacts the valve stem end. Clearance is set and maintained by grinding this tip the necessary amount. The short, sturdy valve itself is closed by a massive pair of hairpin springs, which together exert about 400 pounds compressed. If there was any barrier to the rotational speed of the Squalo engine, it certainly wasn't the valve gear—at least under normal conditions!

Intake valves of near-two-inch size are inclined at 40-degrees to the vertical, five degrees less than the exhausts, and receive their mixture from tapering ports. Double-bodied Weber carbs, eventually of 58-mm bore size, are mounted on small steel frameworks which in turn are bolted to the frame to reduce float bowl frothing caused by vibration of the engine, which is connected to the carbs by lengths of flanged rubber piping. The high-rev goal was indicated by the very large diameter of the high-mounted scavenging exhaust system, which was also longer than that used on the two-liter edition. Better lap times were achieved on the fast Rheims course by using, experimentally, a set of four Dell Orto carburetors.

Weighing 352 pounds, the 1954 Squalo engine was rated at between 265 and 270 bhp at 7600, a speed which was above the line of safe continuous operation. Power was transmitted by a multiple clutch in unit with the engine and a central propeller shaft to the rear-mounted transmission, which had a new and useful layout.

For the new box the four speed and reverse gearing of the usual rear-mounted gearbox was carried over, this having indirect drive on all forward speeds and selection of ratios by dog clutches on the secondary or output shaft. Instead of being well in front of the final drive gearing, though, it was moved back and under the differential, getting it out of the driver's way and allowing a lower seating position. The drive enters on the right-hand shaft and exits on the left-hand one, which transmits torque to the final drive bevels through a set of coarse-toothed spur gears which are readily reached by removing the rear cover plate of the assembly. By this means the overall drive ratio could be changed in about twenty minutes, a handy feature which may well have been inspired by Lampredi's trip to Indianapolis in 1952.

Mounted in the removable cover is a small gear-type oil pump which is driven by a square connection from the primary

shaft and which scavenges the box and feeds oil to the center of the secondary shaft and to the gears and carrier bearings of the final drive. There's a ZF differential, of course, and finely-machined half-shafts to the wheels on which both splines and outer pot-joints were tried, the latter finally being chosen.

Though it was later supplied with integrally-cast brackets, the gearbox was originally mounted on a tubular sub-frame which was fixed by Silentbloc bushes to one of the most revolutionary parts of this Ferrari: the frame. For the first time a Ferrari had been built with a genuine small-tube space frame, and a very nice one it was too. This frame accounted for much of the weight-reduction that was accomplished with this car (1310 pounds dry, higher than the 1200-pound 1953 prototype but still less than the 1430 pounds of the high-chassised 1054 machine), and boded well for future developments. Only a few fabricated box sections were used, mainly for the front suspension mounting, showing commendable restraint and logic on Lampredi's part.

De Dion suspension at the rear was carried over from prior practice but extensively revised to suit the arrangement of components in the Squalo. The de Dion axle tube passed forward instead of behind the final drive unit, to allow ready access to the quick-change cover plate, and was laterally guided by a block sliding in a vertical slot in front of the casing. Parallel radius rods fabricated of large-diameter light-alloy tubing guide the motions of the hubs. In the early '54 cars, which had more flexible gearbox mountings, there was more reason to doubt the precision of the lateral location of the axle. A lack of this precision could have explained the "wandering" tendency noted in early trials. Springing was by a slim transverse leaf placed above the gearbox and mounted from a pivot at its center to lower the rear roll resistance, tending the chassis toward understeer. This was a change from the '53 car, which had high roll resistance. Houdaille shocks were actuated through wishbone-type arms.

Several more complete innovations for Ferrari were to be found at the front end. Ball joints at the outer wishbone ends replaced trunnions and king pins, the ball supports and king post being entirely between the wishbones for the lightest possible weight—principles that were resurrected to the letter in the first Dino chassis of 1957 and which continue to carry the Ferrari colors today. On the Squalo the top wishbone was very short and narrow, much shorter than the lower wishbone, and according to Paul Frere "all the steering gear" was made of light alloy, which may or may not include the wishbones. Mounted in double roller sets to increase roll resistance, the transverse leaf spring passed below the lower wishbones and was linked to them. Tubular rubber buffers were compressed between the lower wishbones and frame extensions to give a degree of rate increase with wheel rise.

Steering was along new lines too. The column ran between the cam boxes to the steering gearbox in the center of the chassis, this box being linked to the trailing steering arms by two equal-length track rods of disarming simplicity when compared to the traditional leading three-part track rod Ferrari system. Lampredi probably "simplicated" too much here, since the steering geometry was not well integrated with the wheel motion and probably accounted for much of the uncertainty in the Squalo's handling that disconcerted the team drivers.

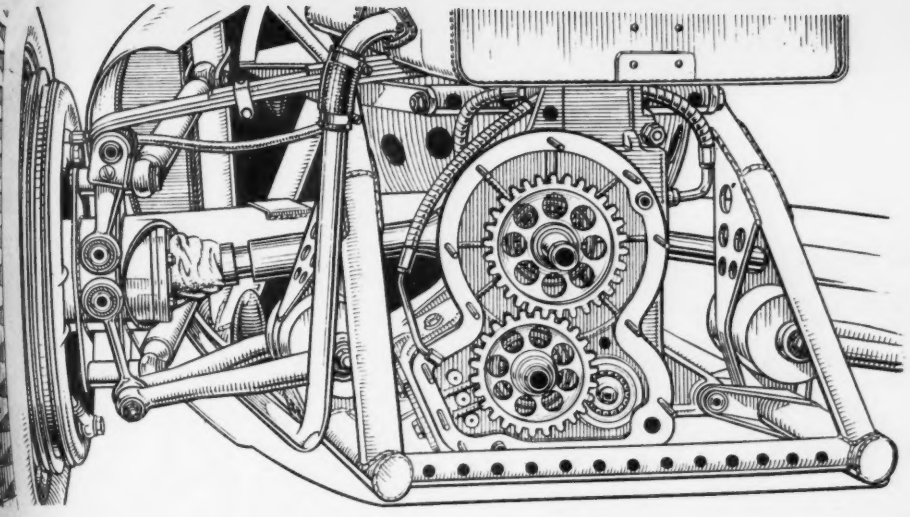
To remain a bone of contention ever since was the placement of the main fuel tanks along the sides of the car, the filler cap being on the right-hand tank. The small rear tank and the oil tank behind it were moved up atop the gearbox to facilitate ratio changes, and the tail shape was raised and sharpened very neatly. There's no doubt that this fuel location, allied with a rearward engine placement rendered unchangeable by the frame structure between the front wheels, gave the Squalo a very low polar moment of inertia and a correspondingly sensitive control response. Before the Belgian Grand Prix in '54 the engine were shifted forward as much as possible to increase both the moment and the understeer for this fast course, allowing Farina to give Fangio's Maser hot chase until a piston broke. The same thing befell Gonzalez, indicating the liberties Lampredi was trying to take with piston speed.

When Mike Hawthorn drove the Squalo at Rheims his comment was that it "did not steer well and felt very peculiar in the corners", but they were the only cars to stay within sight of the flying Mercedes team. At Berne later they were wearing 360 mm Gran Turismo-type brakes instead of the 350 mm Grand Prix assemblies used before, but this wasn't a permanent change. Major corrective action was taken on one Squalo before the Italian G.P., a race that Enzo takes particularly seriously. The entire front suspension and steering was replaced with a standard Ferrari king-pin and triple-track-rod layout, mainly to get the better steering geometry; I doubt that anything could have been blamed on the ball joints, which had to be evicted along with the rest of the mechanism. The result was much better roadholding which allowed Gonzalez to set the fastest lap of the race during his second tour, an accomplishment that might also indicate that the central tank placement is a boon with a full load of fuel aboard.

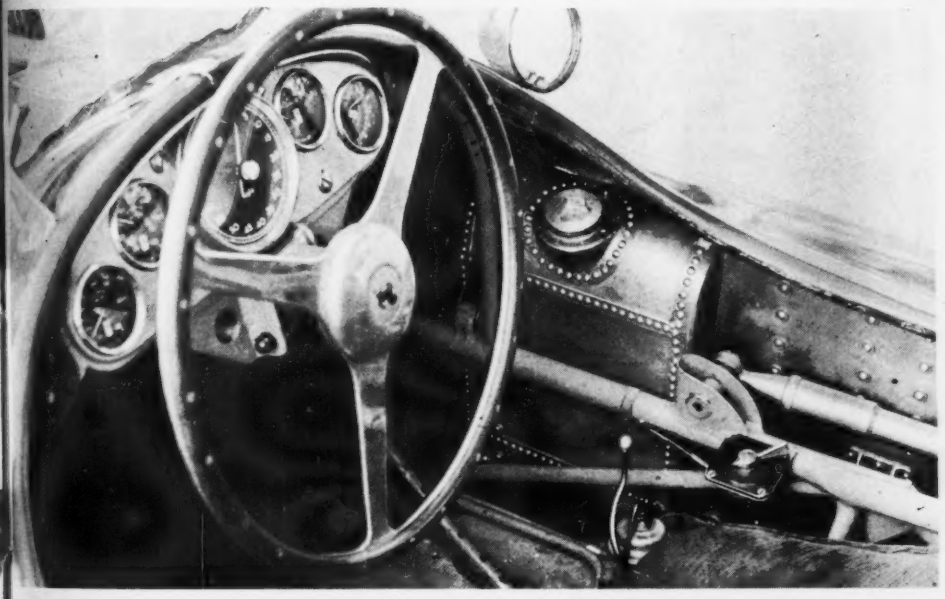
The next step was to toss out the time-honored leaf spring at the front and to install coil springs, for the first time in a Ferrari, in conjunction with an anti-roll bar. Detail changes were made in the rear suspension (the rear spring may have been roller-mounted by now), and the size of the exhaust pipes was reduced. All these refinements added up to some creditable 1'58" laps at Monza during trials about which Mike Hawthorn wrote that the Squalo "was improved out of all recognition and had become a very nice little car". Mike proved it by throwing the revised car around the Barcelona course with his usual abandon to win the last race of the 1954 season.

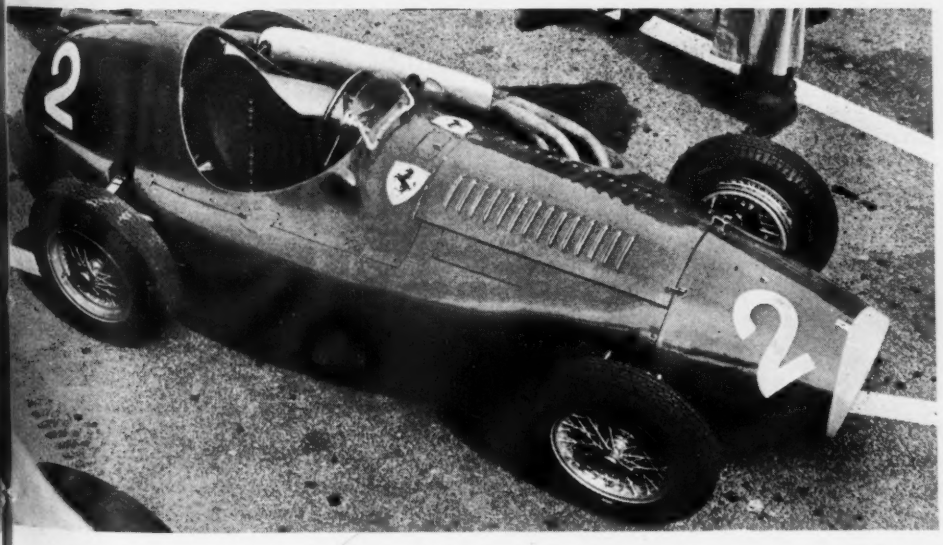
After this successful outcome to a year of development work it would seem that Ferrari had an ideal basis for the 1955 season. With more power under the hood and some attention to detail the type 553 Squalo looked like being at least the best

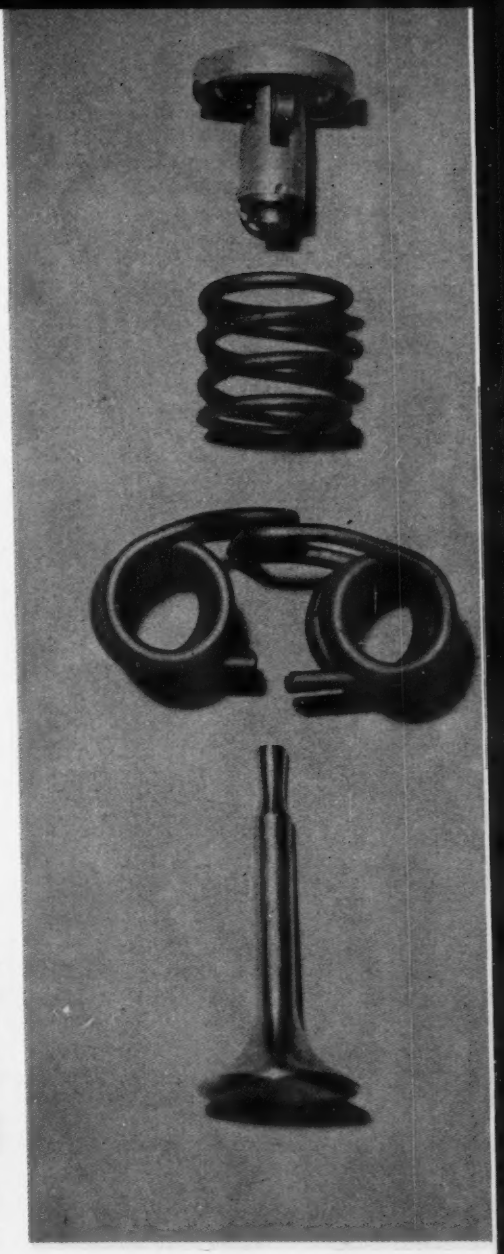
Above: Overhead view of late 1955 Supersqualo with water pump and piping, one crankcase breather just visible in front of engine. Screen in side of body admits air to carbs. This car had more forward location of engine, rearward location of fuel tanks, resulting in a higher polar moment than earlier cars. Below: An impressive view of the 553 Squalo at Berne, Farina in cockpit. Bulges in body house fuel tanks.



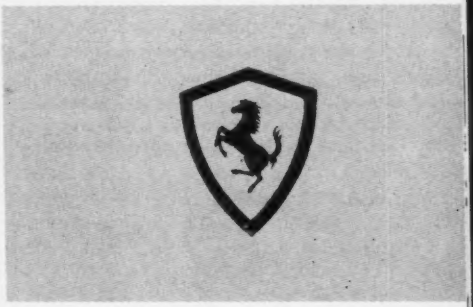
Above: This drawing shows the 1954 Squalo with the gearbox cover removed, exposing the quick-change spur gears. One of the highest possible ratios is shown, there not being room for a bottom gear much bigger than this one. The lightness of the leaf spring can be seen, as can the unusual wishbone arm to shock.



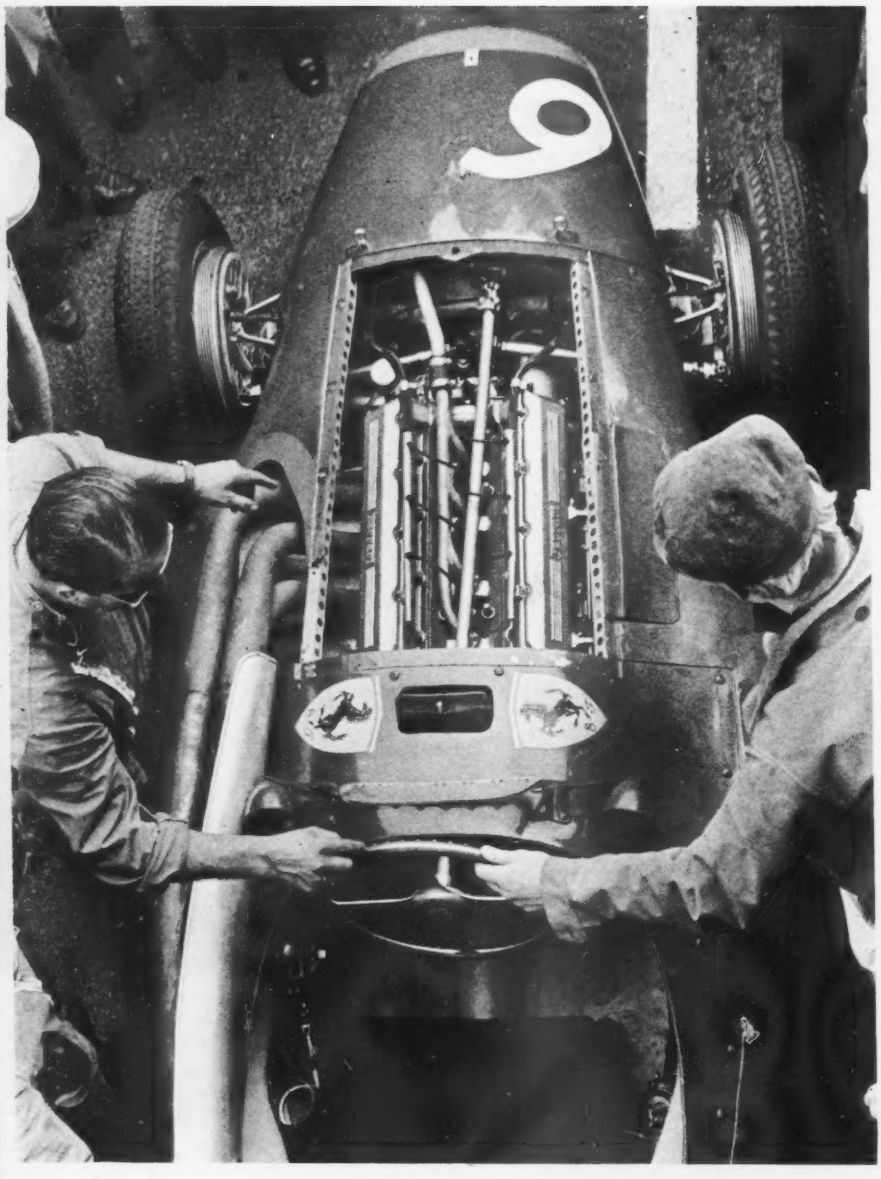


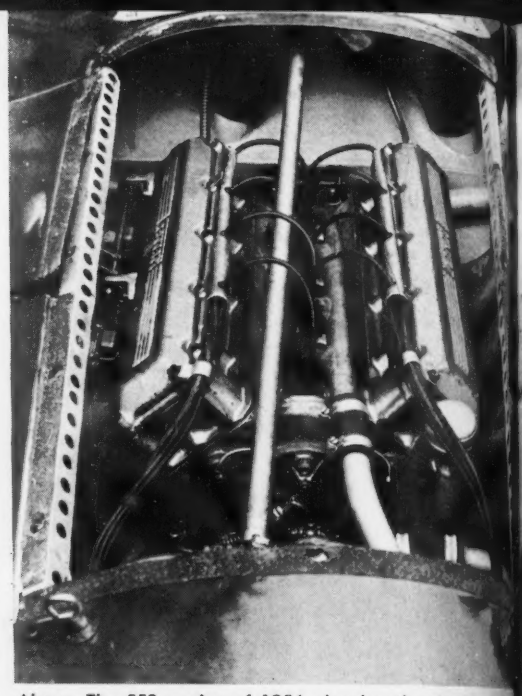



Above left: 1955 Supersqualo, based on two big frame tubes with the trussed superstructure visible in this cockpit shot. Side tanks did not extend forward of the cowl line. Above: This valve gear, actually from a later 4-cylinder Testa Rossa, shows the general Squalo layout of 1954.



Left: 1954 Squalo's intriguing shape is well shown in this photo taken at Rheims. All filler caps were covered by lids.

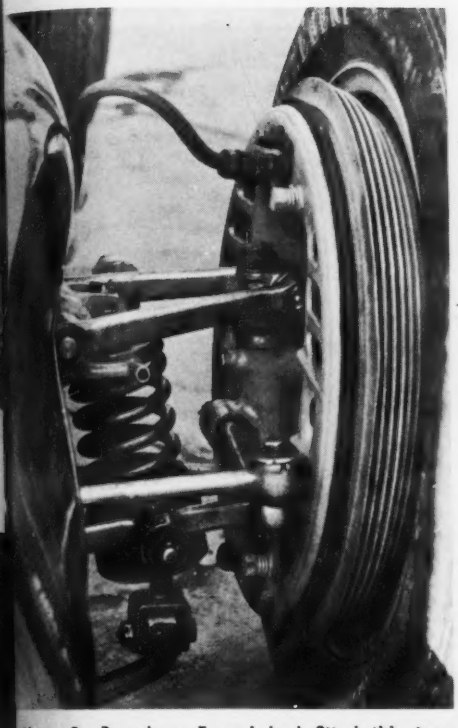




Above: The 553 engine of 1954, showing the steering column running down the center of the engine. Below: Short wishbones and neat ball joint layout are exposed here, as are Formula II-type brakes used during most of 1954. Rubber spring buffer visible.

Above: 1954 car, showing engine placement well behind front wheel centers, central placement of steering box and two-piece nature of track rod layout. Hawthorn at right.

Right: 1954 Squalo (#6) shown with the revised Formula II car which Ferrari used during both the 1954 and 1955 seasons.



Above: By Barcelona Ferrari had fitted this type of suspension to the Squalo, adding coils to the standard wishbones. Tube outrigger limits downward movement of the upper wishbone.

Below: The special brakes used at Berne and elsewhere during '54 and '55 were adapted from GT cars.

Italian car in the running. This promise was never fulfilled for reasons which we can only guess at, but which were probably typically Ferrari. For one thing the firm embarked on an ambitious program of sports car racing in '55, building new sixes of 3.75 and 4.4 liters, 3.5 liter fours and other permutations, in addition to production of three-liter Gran Turismo V12's. To carry all this out certain simplifications were instituted, and there was no room for the kind of unorthodoxy that the Squalo's space frame represented. It's not possible to pinpoint the extent of Lampredi's responsibility for the fact that the new Supersqualo of 1955 was, creatively speaking, a shadow of its former self, being little more than the late '54 high chassis with a special gearbox, side tanks and a reinforced frame. In more detail:

The 553 engine became the 555 through a number of detail changes which changed its appearance only slightly. Probably to incorporate internal oil lines and simplify assembly, the cam drive gear case was split vertically in two. The hold-down studs for the tappet boxes were moved outside instead of inside the boxes, to provide room for a wider type of hairpin spring. Recognizing the actuality that the engine wasn't destined for 7500 reliable revs, the tuning was realigned to give the same 265-270 horsepower at 7000 to 7200 rpm.

Placed well forward, this engine and the quick-change gearbox unit were mounted in a new frame based on two large-diameter tubes tapered at the rear. Above this frame was welded a casual lattice of smaller tubes which also supported the body in part. The '53 prototype had a wheelbase of 82½-inches, which was reduced to 78¾-inches in 1954. For 1955 it was expanded again to 84-inches, only 2½-inches shorter than the high-chassis 1955 car, the very existence of which indicated the confusion in the Ferrari ranks at this time. All the Squalos had front and rear treads of 49½-and-47½-inches respectively, a bias which would move the car toward understeer. A much stiffer rear spring was used, mounted in pairs of rollers, while the front suspension was the new coil type as developed for Barcelona. The Supersqualo's bodywork was even more exaggerated than the Squalo's, the side tank bulges now being vented to exhaust warm air and continuing back to shroud a portion of the rear tires.

In the course of 1955 racing the Supersqualo gained justifiable repute as a brutal understeerer, a serious fault in a season when most of the races were run on relatively tight courses. At Monaco they were in trouble with gear ratios, the quick-change sets not going low enough, and the front end plowed so drastically that the car could just barely get around the two tightest hairpins. At the fast Spa-Francorchamps track the 555 was more in its element, its understeer being rated suitable for drifting the fast bends by most of the team drivers. During the race it was found able to out-accelerate the '55 Vanwall but to be down on top speed from the Mercedes and Maserati, a combination which Farina put together to finish third behind Fangio and Moss in a fantastic drive that left him frustrated by the Supersqualo's lack of sheer punch.

For Spa and for Zandvoort, the next races on the circus, longer noses with smaller air entries were affixed to the Supersqualos. About the Dutch event Mike Hawthorn wrote, "It was the first time I had driven the Supersqualo which had been developed from the car I drove at Barcelona and I could not do much with it on this circuit. It suffered from extreme understeer and even with the steering on full lock it seemed to keep on going straight ahead for an awfully long time on corners. It was quite fast, but mine kept sticking gear."

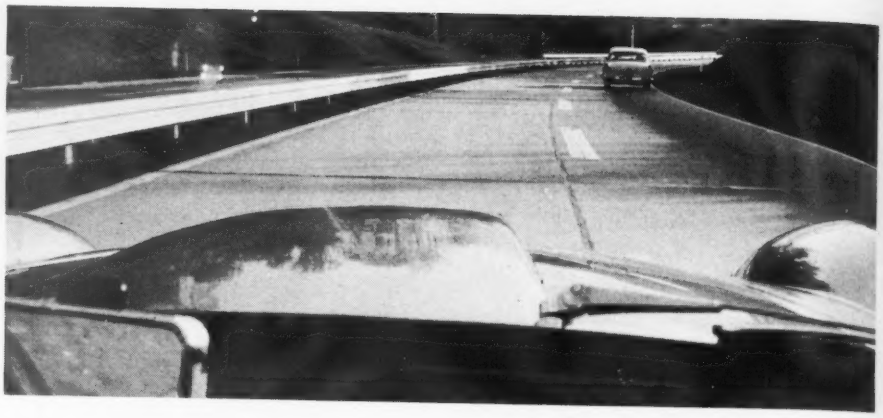
During '55 Ferrari's G.P. efforts were well up in the air due perhaps to some of the factors outlined earlier, and, as Laurence Pomeroy told it, "as so often happens in time of difficulty, controversy arose as to who was really responsible for this state of affairs, and stemming from this Lampredi left the company after some five years of service and joined Fiat". Jano came to Maranello along with the Lancia cars, and Massimino also joined up to do some detail work on the 555. Among other things, he gave it a widened nose once again, and the five forward speeds that the high-chassis cars had had since the beginning of the season.

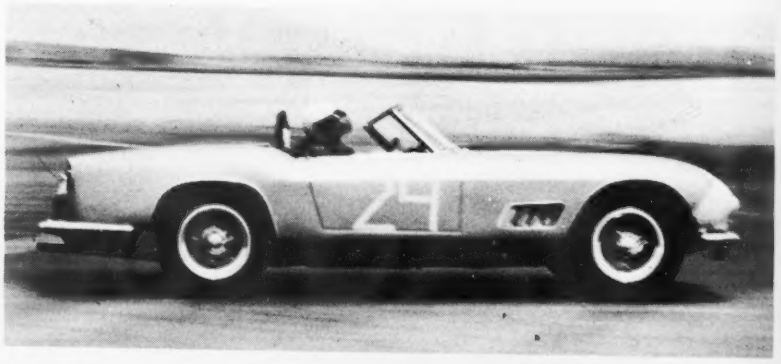
Ferrari gave the Squalo design one last chance in his big experimental session in Argentina in early 1956. A pure Supersqualo was driven there by Peter Collins, and Gendebien was entrusted with a combination of 555 chassis with Lancia D50 engine which must have been a definitive example of understeer. They also brought along a Supersqualo on which all the fuel was piled behind the driver, but this wasn't even worth running in the race. And in this way the Squalos faded from the Grand Prix world.

There was a curtain call of sorts at the New Zealand Grand Prix in January of 1957, for which Ferrari had built and sold two so-called Supersqualos powered by 3½-liter four-cylinder sports car engines. These cars did use the type 555 frame and front suspension, but for easier maintenance so far from home (they stayed in Australia) they were equipped with the ordinary rear-mounted Ferrari gearbox. The de Dion tube curved behind the final drive and was laterally guided by slots in both the gearbox and the frame, as in the earliest de Dion Ferraris. A compromise was struck with the fuel tanks, the rear one being much enlarged but the side tanks still remaining. A small oil tank was at the tip of the rounded tail. For the 1959 New Zealand events one of these cars was fitted with a genuine 555 engine, virtually brand new, bringing it a bit closer to the original idea. It's too bad, taking the long view, that Ferrari couldn't have stayed closer to the 1954 concept of the Squalo. His cars could use some of its imagination and daring today.

*kl*

# RACE WEEKEND





Some months ago we accompanied Bob Grossman of Nyack, N.Y., to the SCCA Cumberland Nationals. Nothing unusual in that, except that Bob has taken up a Ferrari 250 California for Class C Production racing.

In true-blue sports car fashion, he drives it to and from the races, complete with luggage in the trunk. Also, the roll-bar. (The Alfa which he races, too, comes down on a trailer, being a bit more "nervous.")

The trip was without incident and so was the pre-race activity. Luggage was removed, numbers and front-end protection were taped on and the car taken through technical inspection. Brakes gave no trouble here, though they usually grab or pull for the first two or three laps of each race, i.e., until they're warmed up.

He took a few laps of practice to re-familiarize himself with the circuit and check his tire pressures. He ended up with 40 psi front and 42 rear in the Continental Super Records. Then he returned to the pits to cope with questioners who asked, "How in the world can you race such a beautiful car?"

"Because it's *meant* to be raced!"

After dinner, Bob was an early-to-bedder, while his mechanic, Bud Palmer, burned the midnight oil, checking the engine and suspension over carefully, even greasing the latter once more as a precaution. Nothing major was done, the spark plugs weren't even changed, but nearly everything was looked at and its tightness checked "once more".

Race day saw a scorching sun burning down on the West Virginia airport site. (Cumberland is across the river in Maryland, which is so narrow here, North to South, that Bob, staying 30 miles away, was in Pennsylvania.)

He did some scorching too, winning the Alfa race with his Conrero-prepared Giulietta only to have it and two others like it protested as non-standard.

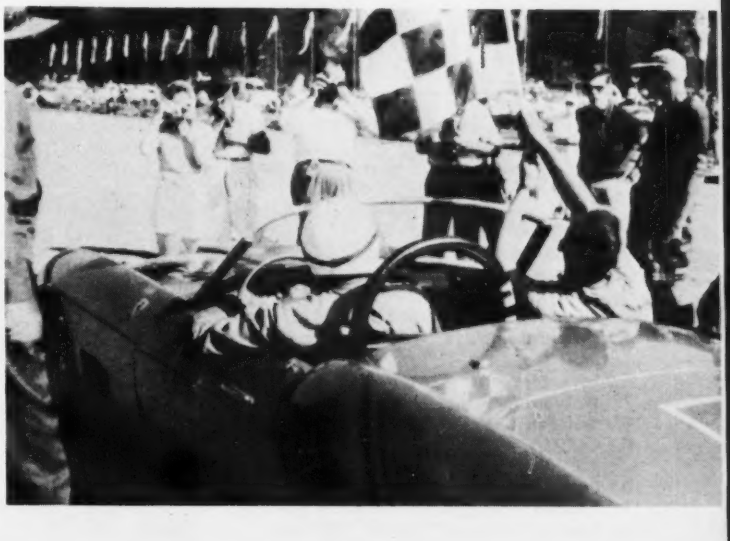
Although the final decision on that hadn't been reached by the start of the "Corvette race", the serving of the protest may have stimulated Bob to great efforts. At any rate, finding himself leading the Class C cars on the starting grid, he resolved to make his battle with the dozen-odd Class B Corvettes ahead.

Helped considerably by a first corner tangle amongst the front-runners, he was in seventh place first time around and subsequently picked up about one place per lap until he had a solid third spot to himself. His trophy, of course, was for first in Class C, but to Bob the real joy was in doing so well against Chevvies with a car that he really had driven to the race. He also drove it home that night.

## TAILPIECE

Bob's next race was at Bridgehampton where he caught all but one of the Detroiters. After a trip to Le Mans (full story next month) he topped this with a sterling performance at Lime Rock's Fourth of July Nationals. All other Class C opposition having evaporated, the organizers put him in Class B with the Corvettes. He still had to start behind them all, but by the end of the twenty lap dice, the order was reversed. Happy day for Enzo and Luigi, not to mention Bob and Nat Thaler. Nat has bought the car but still lets Bob drive it, pending the arrival of Bob's Le Mans mount, a California of the "latest series."

Having raced nearly every sports car under the sun, Grossman feels happiest of all with his Ferrari association. "It may be expensive, but it's reliable. In thirteen races, I haven't yet had a mechanical failure." —*sfw*



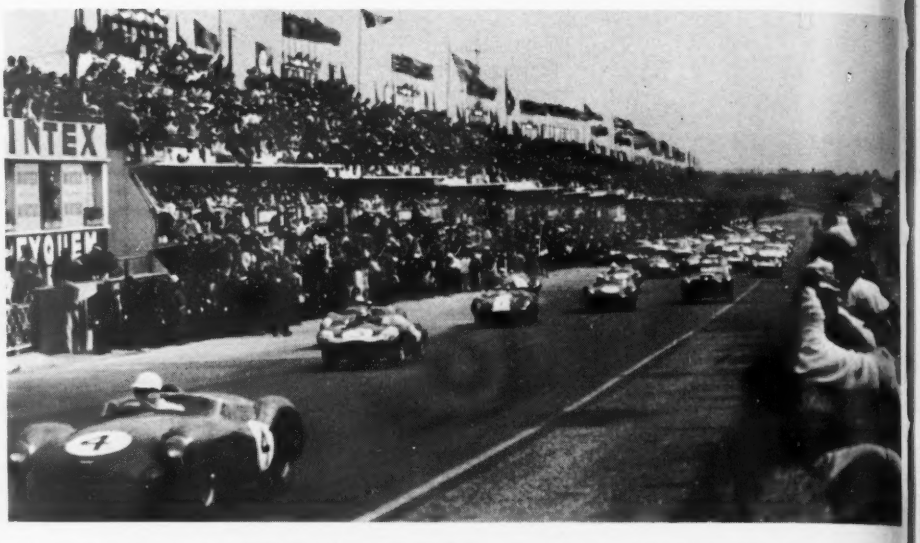
# "CA C'EST LE MANS"

*by Jesse L. Alexander*

► And that's exactly what Olivier Gendebien did say as he climbed dejectedly from behind the wheel of the Ferrari and joined his wife on the pit counter to watch the mechanics push the 3-liter Testa Rossa slowly away. Its mates were already there; the Gurney/Behra 3-liter, the Allison/da Silva Ramos 3-liter, and the Cabianca/Scarlatti 2-liter. Once again, Ferrari had suffered a serious defeat, this time in the most important (to him) sports car race of the year and in the one race of the year that his cars could have won in a walk if they had been prepared in a realistic manner.

The defeat actually started back in April when the Maranello team traveled all the way to Le Mans for a single day of practice in which gear ratios and handling were to be sorted out. At that time it was found that both the 3-liter and the 2-liter were tremendously fast, and it was also obvious that the Astons were very definitely down on power—though good on both handling and braking. Ferrari handling left something to be desired, but the engine and the Dunlop-Mintex disc brakes were the best part of the car . . . at least in the minds of several of the drivers. With plenty of time to put it right and to fit a higher rear axle ratio it was felt that Ferrari would have no trouble winning Le Mans hands down. But as Phil Hill put it. "We might just as well have not bothered coming in April—for all the good it did us."

Just what was the Ferrari problem? First of all, cars were still undergeared; 8000 rpm in 5th gear worked out to 180 mph, 8000 coming up within the first two miles of the Mulsanne straight; "we're not far from flat out all the way down the straight", said Cliff Allison. The Ferrari engineers restricted their drivers to 7500 rpm—but not all obeyed these orders re-




Above: The start of the 1959 Le Mans with Stirling Moss in the lead in the number four Aston. Below: Carroll Shelby drives the winning car to the award stand. Salvadori behind him, waving.


Below left: Dan Gurney explains traffic problems to Jean Behra while their Ferrari takes on fuel. Below right. One of the privately owned SAABs with the four-speed gearbox drifts in fine style.


*Results, 1959 Le Mans 24 Hour Race*

General Classification:

1. R. Salvadori/C. Shelby (Aston-Martin DBR1-300) 324 laps = 4347.9 km (2701.1 miles) average: 181.163 kph (113.3 mph). (1958: 106.12 mph.)
2. M. Trintigant/P. Frere (Aston-Martin DBR1-300) 323 laps.
3. Beurlys/Elde (Ferrari 250 GT) 298 laps.
4. Pilette/Arents (Ferrari 250 GT) 297 laps.
5. Grossman/Tavano (Ferrari California) 295 laps.
6. Fayen/Munaron (Ferrari 250 GT) 294 laps.
7. Whiteaway/Turner (AC Bristol) 274 laps.
8. Lumsden/Riley (Lotus Elite) 271 laps.
9. Cornet/Cotton (DB Panhard) 259 laps. (INDEX WINNER).
10. Clarke/Whitmore (Lotus Elite) 258 laps.
11. Consten/Armagnac (DB Panhard) 248 laps.
12. Norttop/Bengtsson (SAAB) 233 laps.
13. De Lageneste/Guiraud (Stanguellini) 221 laps.


Left: A good reason for winning. The girl with Carroll Shelby was not his co-driver but seems to please him nevertheless. Neatly attired gentleman keeps crowd at bay. Below left: Ferry Porsche and team manager Von Hanstein look very glum after all their cars dropped out. Not one Porsche, team car or private, crossed the finish line. Below: The Grossman-Tavano Ferrari is followed by the twin-cam TR-3. The Le Mans Triumphs had fiberglass bodies and longer wheelbases, were fast but didn't finish.

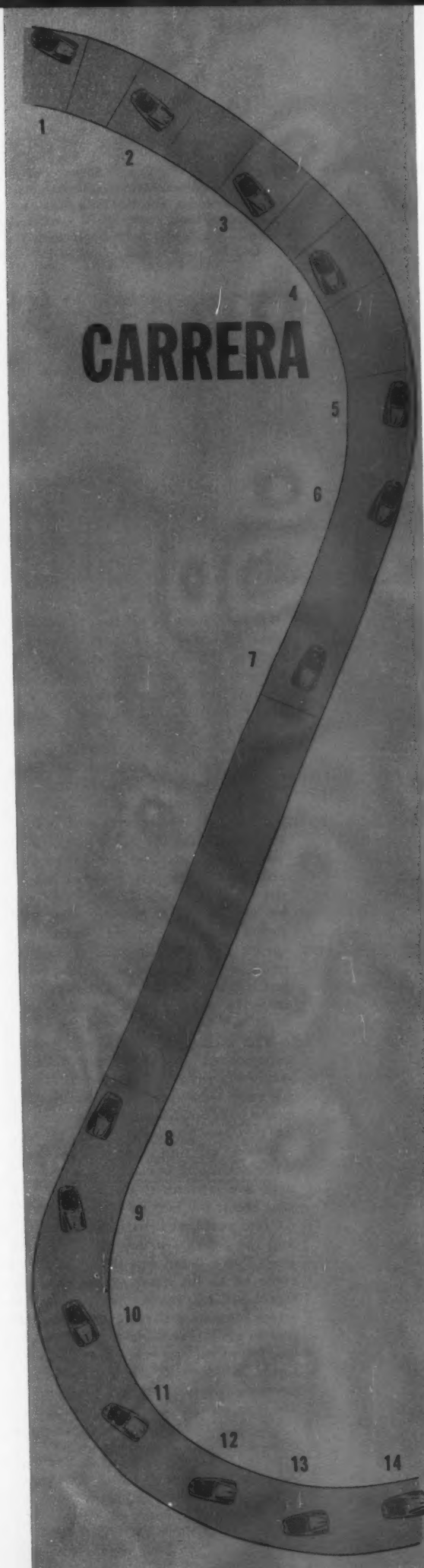


Above: These two Lotus Elites finished, with #41 running beautifully having had nothing done to it. The Lotus sports-racing cars didn't fare as well having blown both the 2.5 liter and 750 cc engines. Below: Roy Salvadori is shown in complete control of the winning Aston co-driven by Carroll Shelby.

ligiously, least of all Behra. Second factor that contributed to their downfall was a serious lack of organization on the part of the team managers. To the observer, Ferrari team organization was the most hap-hazard of any. No one to our knowledge kept a serious lap chart nor could one find out in the Ferrari pits, at any time, what the positions of their cars were or the gaps between them. Admittedly the signalling set up at Le Mans is not the most convenient with a telephone line connecting the signal pits at Mulsanne while Amoratti and the other engineers remained in the pits. Another headache in the Ferrari camp is the huge gap presented by the language barrier. Phil Hill and Behra just get by in Italian; Tavoni speaks a limited amount of English and perhaps understands more than he admits, but it is still a considerable barrier to constructive organization. Most of all Ferraris lack an engineer who can also drive.

The Italian failings were all the more conspicuous by the mere presence of Aston-Martin and Reg Parnell. The Aston pit stops were thrilling to watch; once the brake pads on all four wheels were changed on two cars during the race, the car was refueled, oil tanks topped up, and rear wheels changed. In each case it took slightly over five minutes to do all this. The less said about the Ferrari pit stops the better. At one point, just as it was getting dark and the Behra/Gurney Ferrari was in the lead, Dan Gurney felt the gear shift lever come off in his hand. As he went by the signal pits he waved the lever to the observer indicating that he was calling at the pits to get it fixed. He drove into the pits but found no one ready for him and was forced to do one more lap. Next time around—always in second gear and losing precious seconds, he came in again, and

*(Continued on page 90)*




# IN COMPETITION

***By "Pup" Pupilidy***

► Driving a production Porsche on the Lime Rock circuit, or any other sports car course, is both rewarding and challenging. The rewards are self-evident and the challenge is there because the Porsche, being a rear-engined car, presents an entirely different set of problems to the driver accustomed to "more conventional" front-engined machines. I don't mean to imply that the Porsche is a difficult automobile to drive; I have found it to be one of the most responsive sports cars in the world and certainly one that requires a minimum of physical effort in any situation. And yet, though you can easily go fast in a Porsche, you can also easily make mistakes if you don't understand the techniques involved and how to master them.

Much has been made of the fact that the Porsche is an "over-steerer." Now, in a car that oversteers, the front wheels tend to head further into a turn once the steering wheel has been set and when the limit of adhesion has been reached, it is the rear wheels that will break traction first. Obviously this combination of circumstances could cause the car to swap ends in a hurry and that is exactly what will happen if you don't drive an oversteering car correctly. But even a car that normally understeers will often oversteer if too much power is applied (or for other reasons) and late model Porsches do not oversteer nearly as much as older ones anyway. My own Porsche — the one used for this article — is a Carrera Speedster on which I adjusted the camber of the rear torsion bars four times until I got just the steering characteristics I wanted. The way it is now, the car normally steers neutrally and will oversteer on hard throttle, which is the way most experienced race drivers seem to prefer their cars, whether they be rear-engined jobs or not. (It would be difficult to make any front-engined car oversteer as readily as the Porsche at any given speed, however.) I should say here that if you set up any other new-model Porsches with the same rear camber as mine, models without the 125-horsepower Carrera engine and a 6.31 rear axle, that is, you will not be able to induce as much "power oversteer" because there isn't as much power available with the push-rod engines. Therefore, if you advance to the point where you would like to incorporate the use of deliberate oversteer into your driving technique, you will probably want to leave the rear torsion bars of these other Porsche production models alone. Why all this emphasis on steering

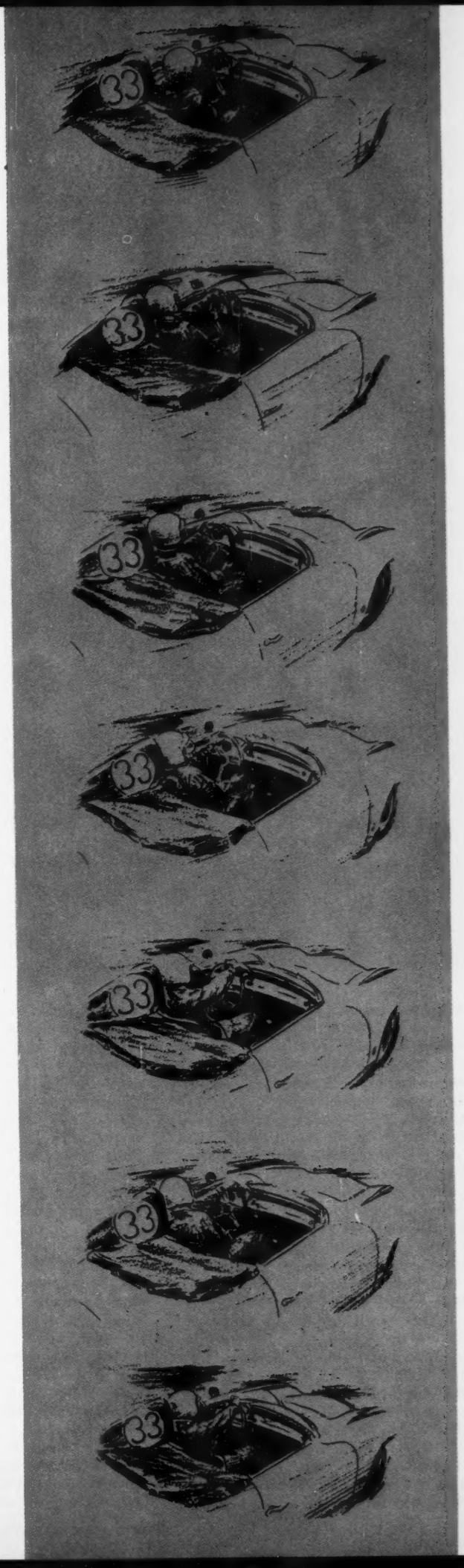
characteristics? You'll see in a moment.

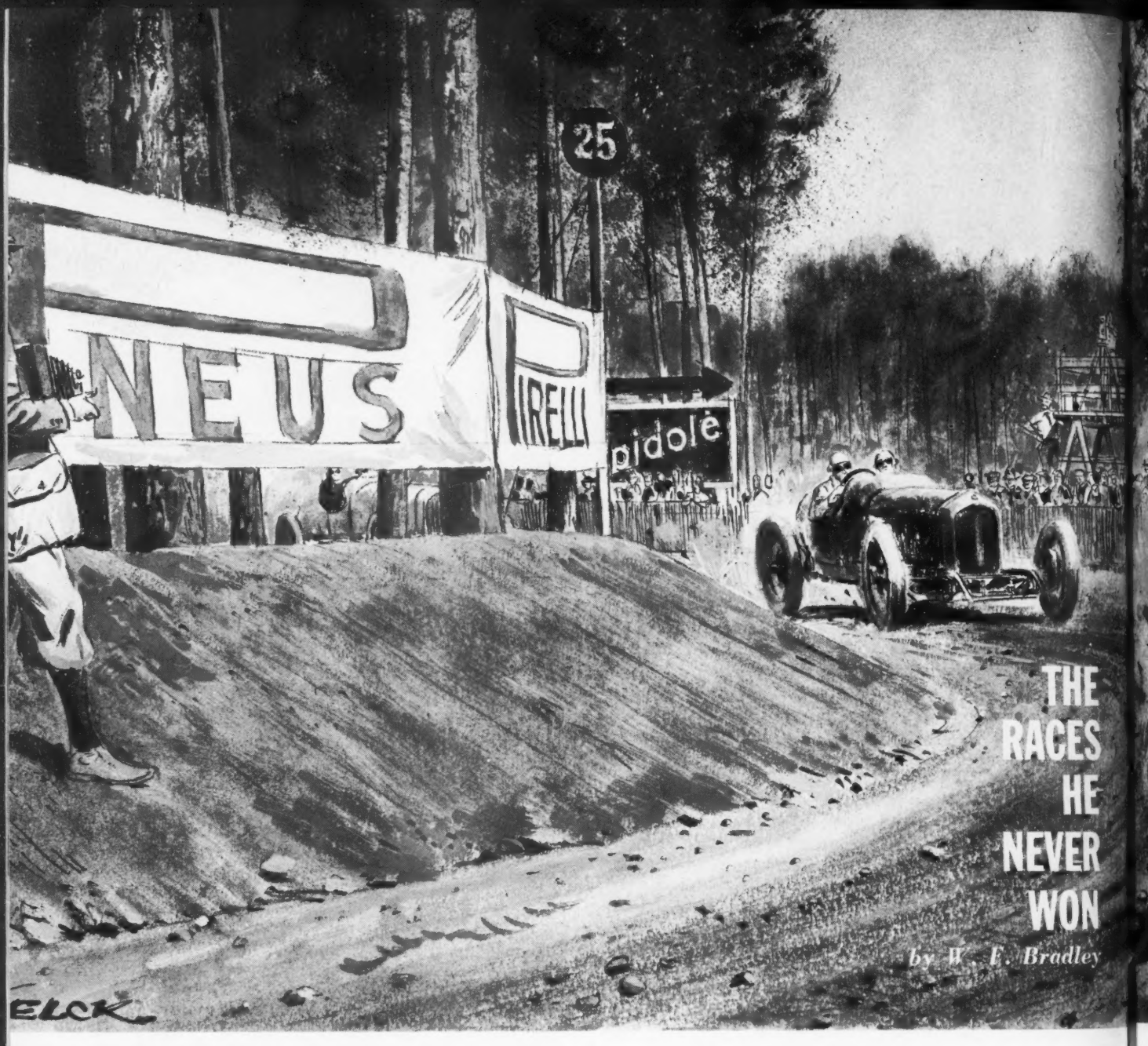
If you have followed the results of the various racing meets at Lime Rock, you will know that the Carrera Speedster is just about as fast on that circuit as any production car, regardless of engine size, this in spite of the fact that it doesn't have as much top speed or quite as much acceleration as a couple of the big-bore machines. Cornering, then, is the secret of the Porsche's success, and there is a series of corners — or call them bends if you will — right after the main straightaway that make all the difference between good and not-so-good lap times. What follows is a description of how I drive the Carrera Speedster through these particular bends.

At the end of the pit straight, the first turn we see is a fast right hander with a more or less constant radius. The thing to keep in mind in connection with this turn is that another trickier turn follows it so closely that you don't have any time or space in which to correct for the mistakes you may have made in your original approach. The line through the first right hander is an obvious one but your speed is a critical factor. If this turn led into another straightaway we could probably take it faster than we can with the second turn following it. As it is, though, I come off the straight, in third gear, at better than 80 mph, slice across the road to the right-hand side of the turn, on the inside, and allow the drift to carry me across the road to the outside again, not quite half-way between the two turns. This first turn, for reasons of perspective, could not be shown in the illustrations for this article (except for the overhead diagram of the entire course) and so we begin the numbered sequence from this point, on the left side of the road approaching the second turn, called the Hook.

By the time the car has drifted to position number one I have begun to back off on the throttle and my speed is down to about 70 mph. From here I am going to set up another steady drift all the way around the Hook, which gets its name from the fact that it gets tighter and tighter as you head into it. Some drivers do not feel that they actually "drift" this turn, but claim that they slide instead. I suppose that some cars, especially the larger, heavier ones that stay under 60 mph through the Hook, do actually slide, or must be made to slide so that the corner can be taken

*(Continued on page 95)*






# THE RACES HE NEVER WON

*by W. F. Bradley*

► One soft summer evening in 1921 the sleepy town of Le Mans was treated to a performance of oratory by one Ernest Ballot. The Place de la Republique echoed to the tones of his hoarse voice as he explained — after mounting a proffered wooden box — that his cars had won a moral victory in the recent French GP. To the ever-increasing crowd his lament sounded like this:

"Look at the cars. Look at my cars, in perfect condition, all ready to start out again. Then look at that American junk, all shot to pieces, unfit to go another mile. If they had only lengthened the race a little bit I should have won. I am ready to start again; let them line up again just as they are, and you will see what Ballot can do. I may not have got the Grand Prix, but I am the moral winner of this race."

That this impassioned diatribe should be delivered by one of France's leading builders of proprietary gasoline engines was the last sad act in a series of vignettes set into motion by race driver Rene Thomas. Ballot had no more thought of building race cars than of spearheading a movement for the return of steam propelled vehicles. Thomas, however, had other thoughts. In 1914 he had had the exhilarating experience of strapping $20,000 dollars to his chest to keep it safe while enroute to his native France from the barbarous city of Indianapolis. His victory at the brickyard had kindled a desire—which glowed undamped through the war—for more wins and more American money.

Rene's suggestion to Ballot about building a team of cars and getting them across the Atlantic to Indianapolis as soon as the fighting had ceased, appealed to the dynamic French businessman. The plan, as finalized, had the design work being done by the Swiss engineer Henry, who had fathered the fabulous pre war Peugeot racing cars, and the driving to be done by the 1914 winner. To all concerned it seemed like certain victory for France at Indianapolis in 1919.

Ernest Ballot, with his buzz-saw approach to red tape and inefficiency, surmounted all problems thrown up by the war-shattered French economy and built four race cars in the record time of 101 days. The cars were powered by straight eight engines, made up of two blocks of four, with a bore and stroke of 74 by 140 mm. The power plant design was reminiscent of the 1914 Peugeot, while the transmission and chassis were directly inherited from earlier versions of the same cars.

On arrival at Indianapolis the Ballots soon proved themselves the fastest cars on the track during practice sessions. They also proved to the team manager's satisfaction that the gear ratio was too high. Not having spare sets of ring gears and pinions to lower the ratio, American wheels and tires were mounted for use in the race. As so often happens in racing, there was not time to try the new equipment before the starting flag dropped.

Before the race had gone 100 miles the Ballots were in trouble with their untested wheels. Spokes snapped, tires blew, and the pit crew earned their keep in bringing the highest placed team car home fourth behind two Peugeots. That the two winning cars had been sold by the Peugeot factory in 1914 as unfit for further racing did not help to lighten the gloom in the

Ballot equipe, far from their French home.

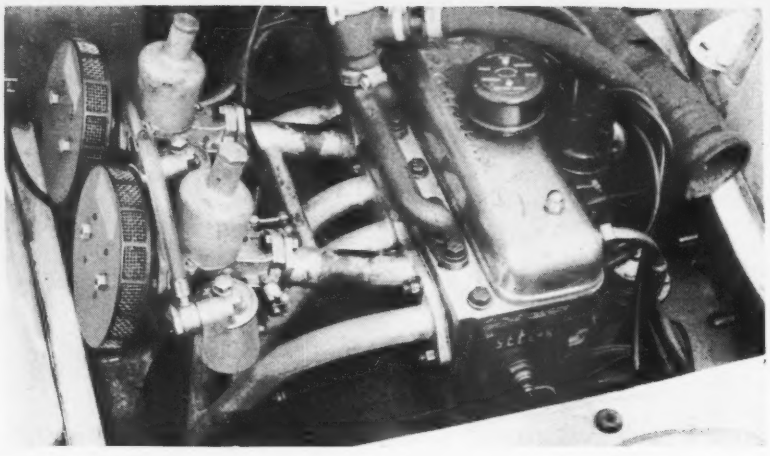
As would be expected of a business tycoon who disliked being thwarted, Ernest Ballot determined to return to the big Indiana oval in 1920 and right the horrible wrong that had been done to his cars. This time however, logic would prevail. Ballot himself would accompany the team to the United States, while veteran Indy driver Ralph de Palma would spearhead the all-out effort. This steam roller approach seemed to be working, for toward the end of the race the big blue Ballot was whistling around well in the lead with the imperturbable De Palma in complete command.

In a few minutes Ballot would be able to cable to France that the cars bearing his name had swept to an easy victory. But at that precise moment a wild yell went up from the crowd. De Palma had slowed down. He was coming into the pits. "Carburetor," said the mechanics, and they made adjustments and sent him away, only to see him return after another lap. Engineer Henry, Ballot and the mechanics consulted in wild excitement, to conclude that the magneto was failing on four cylinders. "Cut out four and let him finish on the other four." It was done with no better results. A wild message was flashed to Thomas to speed up. "Why the Hell has he been hanging back?" growled Ballot. But Gaston Chevrolet needed no message. He had realized what was happening and was spurting savagely, while a little further back Tommy Milton and Jimmy Murphy were seeking to take advantage of De Palma's misfortune. Thomas responded but it was too late for him to catch up with the speedy Monroe and when De Palma stuttered over the line, both Milton and Murphy were ahead of him.

Crumbling his cable, cursing Thomas, but still strong in his admiration for Ralph De Palma, Ernest Ballot expectorated with his usual precision and growled "Ma poisse."

The American debacle for the Ballot team was heart breaking, but the worst was yet to come. The last sad chapter started with a cable received by the A.A.A. representatives in Paris reading, "Enter three Duesenberg cars French Grand Prix." Even in 1921 substantial entry fees (in gold) had to be paid to compete in the annual race organized by the Automobile Club de France. The Duesenberg Brothers in Indianapolis neglected this formality and it just happened that the Paris representative found himself short of funds, and short of time, for entries closed in less than twenty-four hours. On paper the prospects for the French race looked brilliant, for the contestants were Ballot, Fiat, Talbot-Darracq, and a lone Mathis. But the A.A.A. representative, who was also a newspaper man, knew the inside story. He knew that Fiat had run into difficulties and would quietly fade out of the picture. He knew that the Talbot-Darracq engineer was idling in Capri, that the works manager refused to help in building the racing cars, that the test bench engineer had fought with the assembly line chief, to the delight of the mechanics who had no sympathy for either of them, and despite the fact that Segrave, Guinness, André Boillot and René Thomas had been signed on to drive in the race, a miracle would be necessary to get them to the starting line. That reduced the

*(Continued on page 80)*



Above: Top end modifications include two side draft S.U. carburetors, a four-into-two exhaust manifold (Rudd item), and plated rocker cover marked, "Dauphine G". Below left: Steering wheel was resplined to "crooked" position to allow view of tach.- Below right: Water and oil temperature and oil pressure gauges in center panel.

## PERFORMANCE

**TOP SPEED:**

| | |
|---|---|
| Two-way average | 82.45 mph |
| Fastest one-way run | 82.90 mph |

**ACCELERATION:**

| From zero to | seconds |
|---|---|
| 30 mph | 3.8 |
| 40 mph | 7.4 |
| 50 mph | 10.4 |
| 60 mph | 16.1 |
| 70 mph | 26.3 |
| Standing ¼ mile | 19.9 secs. |
| Speed at end of quarter | 70 mph |

**SPEED RANGES IN GEARS:**

| | |
|---|---|
| I | 0-23 mph |
| II | 10-47 |
| III | 18-68 |
| IV | 24-top |

**SPEEDOMETER CORRECTION:**

| Indicated Speed | Timed Speed |
|---|---|
| 30 | 28 |
| 40 | 35.5 |
| 50 | 46 |
| 60 | 53.5 |
| 70 | 64.5 |
| 80 | 73 |

**FUEL CONSUMPTION:**

| | |
|---|---|
| Hard driving (including performance testing) | 30.2 mpg. |

## SPECIFICATIONS

**POWER UNIT:**

| | |
|---|---|
| Type (or name) | In-line four-cylinder, water cooled. |
| Valve operation | Pushrod, in-line valves. |
| Bore & Stroke | 2.28 x 3.15 in (58 x 80 mm) |
| Stroke/Bore Ratio | 1.38/1 |
| Displacement | 51.4 cu in (845 cc) |
| Compression Ratio | 9.5/1 |
| Carburetion by | Dual semidowndraft SUs. |
| Max. Power | 51 bhp @ 5750 rpm |
| Idle Speed | 800 rpm |

Rudd saves four pounds of unsprung weight per wheel by reverting to earlier "spider" type.

Below: Once the rear lid is opened it is immediately apparent that this Dauphine is not quite stock. Dual carbs and smooth flowing exhaust are most obvious, the rest is inside.



With bumpers removed and the entire car lowered by two inches as described in text, the modified Dauphine looks purposefully squat next to 5 ft. 7 in. Dennis May.

# DEBONAIR DAUPHINE

*by* ***Dennis May***

***Double-instalment conversion adds up to a 66% power bonus.***

▶ In France, trying to teach Amedée Gordini anything about winning extra CV from an automobile engine would be like lecturing the late Marie Stopes on the facts of life. So when Renault hired Gordini to strop a non-standard edge onto the Dauphine, the resulting conversion was generally accepted among Frenchmen as the *dernier cri* in its field. No sooner had the kit made its English landfall, however, than the brash islanders started superimposing still more poop on the top-dressing already superimposed by Gordini.

Transformers of the tranformation are K. N. Rudd (Engineers) Ltd., of Worthing, Sussex, who used to market an all-their-own Dauphine conversion before the Gordini titbit came along. The former, in its day, outperformed the three or four rival sets available from English sources, but the Gordini-Rudd deal in turn outperforms the straight Rudd ensemble. Ken Rudd, principal of the Worthing firm, is a well known figure in British competition circles, with a fat dossier of successes in sports car races and hillclimbs on AC Ace-Bristols.

As a basis for comparisons, these are the power figures for the three stages of Dauphine that concern us:

*Stock:* 30 bhp at 4250 rpm.

*Gordini:* 37.8 bhp at 5000 rpm.

*Gordini-Rudd:* 51 bhp at 5750 rpm.

Gordini, it is only fair to conclude, went to work with the *Regie Nationale Renault* looking over his shoulder and telling him where to draw the line; obviously he could have done better in terms of output if the *Regie* hadn't had price and ease of production problems on their mind. Rudd on the other hand had his sights set for a smaller and better-heeled clientele, and his inhibitions were diminished accordingly.

Here, then, are Gordini's own medicaments for Renault's 845 cc 4-cylinder engine:—Compression raised from 7.75 to something over 8/1 (the ratio was recently given a second slight hoist, and isn't precisely known at this writing); redesigned intake and exhaust manifolds fitted, former carrying an oversize (PB1) Solex carburetor—full downdraft, as in stock specification; combustion chamber design modified; reinforced rocker shaft added; valves reangled from vertical to a 7 deg. inclination, and standard rockers replaced by longer ones to increase valve lift without any change of cam contour; heavier valve springs fitted; cylinder head cooling improved, using dual input pipes between cylinders 2 and 4.

From the above starting point, Rudd machines the alloy head a mite to make the compression ratio either 9 or 9.5/1, to customers' choice; fits a hotter camshaft; discards the Gordini manifolding and substitutes his own; uses twin 1⅛-in. (Hl) SU carbs, mounted on tuned-length (8-in.) stubs with a semidowndraft angle of about 20 deg.; narrows the inlet valve seat width and ups the exhaust insert diameter from 25 to 27.5 mm; supplies oversize valves; carries out further port enlargement and reshapes the reshaped combustion chambers; does a nice matching job between ports and manifolds; fits Lodge HN plugs (these correspond to Champion L10S in heat forbearance); adds a special breather, emerging from the rockerbox cover, to take care of vapor buildup at high revs.

Characteristics of the new cam are as follows:—Intake opens 10 deg. BTDC and closes 42 deg. ABDC; exhaust opens 48 deg. BBDC and closes 12 deg. ATDC. Valve lifts are 0.255 and 0.266 in. for inlet and exhaust respectively.

The Rudd exhaust system is a pretty thing, coupling cylinders 1 and 4, 2 and 3, and is thereafter duplicated right through to the final exits. At 1⅛-in. bore, the offtakes are oversize. To accommodate pipework of the optimum length, the dual sound-absorbtion silencers are mounted transversely, just under the extreme tail of the car. Visible as it is, the rear silencer hints broadly at this Dauphine's special character, though the literate are anyway let into the secret

*(Continued on page 92)*

# racing brakes part 3

*by Karl Ludvigsen*

► Ever since disc brakes won Le Mans for Jaguar in 1953, Britons have been glancing furtively about, musing uneasily, "Whatever in the world are these Germans and Italians waiting for? Don't they see that there's no need to waste time on those third-rate drum brakes any more? Discs are unquestionably the best . . ." and, a bit under the breath, "or are they?"

There are two sides to this shilling. The perspicacious will have noted that, with the outstanding exceptions of Lockheed and Wellworthy, the history books of racing braking have been inked almost exclusively by Italians, Germans and, indeed, Americans. Arriving just in the nick of time, like the messenger before the hanging, discs were the saviour of such modern British competition machines as the D-Type Jaguar, BRM and Vanwall. Yet they couldn't be considered a valid alternative to drum brakes until one of the drum experts—Mercedes, Ferrari or Maserati — had tried them and found them better.

Late in 1953 *The Motor* reported that "Ferrari was emphatic that on his present racing cars braking presents no problem, and the existing equipment has proved adequate. He still feels, however, that disc brakes offer important reductions in unsprung weight, and has a disc brake of his own under development. It operates on an entirely different system from the British Dunlop and Girling, being more like a clutch in construction." Today special-builder Enrico Nardi feels likewise about the potentialities of the clutch-type disc brake.

Under the prodding of Stirling Moss, Maserati in 1956 tried Dunlop-type discs, but never used them in racing in place of their own fine drum brakes. Gordini had naught but grief with the Messier system. Finally, in 1958 Ferrari had been able to obtain production Dunlop discs to try on Peter Collins' G.T. convertible, and these self-same binders appeared on Hawthorn's Dino at Monza when, through nobody's fault but his own, Ferrari's drum brakes had been found ineffectual (see Parts I and II).

With Dunlops a *fait accompli* on one Ferrari, Girling seemed unaccountably disposed to deliver that set of discs that Enzo had ordered such a long time ago. Thus came the millennium. This final chapter in our arresting tale will present a few continental characters but will be written in the main by the British.

An incorrigible innovator, Harry Miller must get the credit for the first use of disc brakes in racing. Conceived in 1937, Miller's Gulf cars used an enclosed clutch-type brake along the lines that Ferrari later favored. To haul hot fighter planes down to a halt on the short decks that had to be used during the war, spot-type disc brakes proved ideal and were refined under Goodyear patents. Thence it was only a few years' jump to racing cars, once more.

What do disc brakes—specifically spot brakes—have that drum brakes don't? I can begin by saying that they eliminate any and all concern over that never-quite-solved bogey of the drum brake: structural strength. However much a racing drum is stiffened by fins, ribs and flanged liners, it will always be subject to a degree of flexing when the shoes are applied.

Even with the best design, as we've seen in Part II, drums are also vulnerable to an assortment of metallurgical maladies resulting from the compromises that must be made in their construction. They're heavy too. A disc, on the other hand, is pressed relentlessly on both sides by its spots and caliper; it has no place to go.

It has, as the brake engineers put it, good "shape stability". Whatever minute shape changes that do take place have far less effect on the friction characteristics than in the drum brake, in any case. In self-wrapping or servo effect the spot brake strikes a mean between trailing and leading shoes, being if anything closer to the trailing shoe in having a very progressive, stable, fade-resistant characteristic. And it's light.

Being light in weight, indeed, a disc brake has a far lower capacity for heat than a drum unit of comparable power, and thus after a series of stops or a halt from high speed it often endures temperatures that drum brakes never know. As mentioned in the section on linings, this called for some advanced thought on pad composition, while the discs themselves just have to take it now and then.

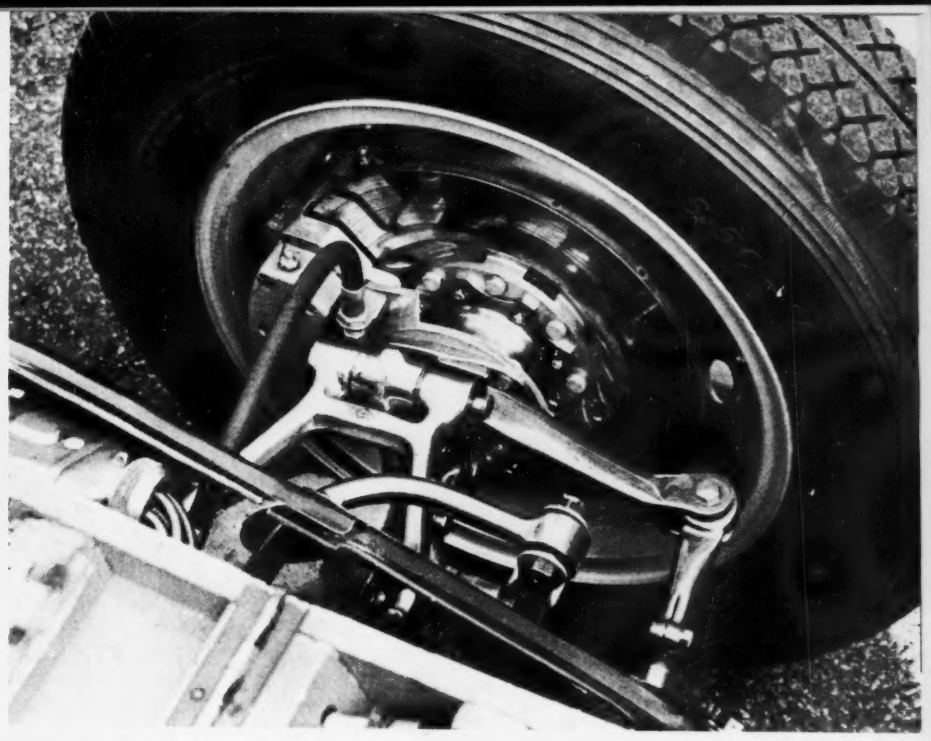
Since the braking surfaces are exposed to air flow, of course, heat can escape very rapidly. Seldom are special cooling provisions required for the discs or calipers themselves. Modern know-how in materials, combined with the naturally stable shape of the disc brake, has simply allowed the necessarily high unit temperatures and pressures (as much as two tons per caliper) to be borne without damage.

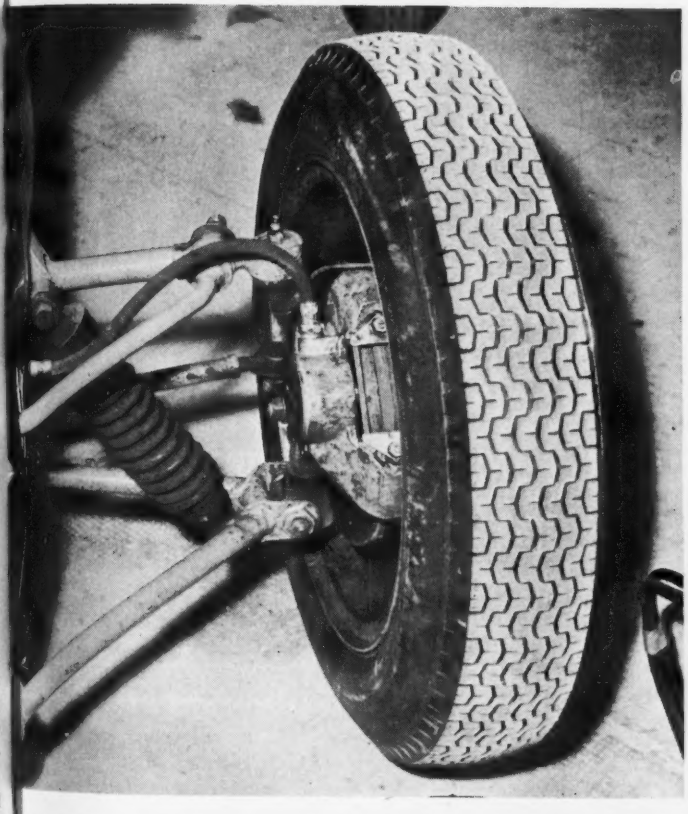
At these higher heat levels it's also logical to expect radiation to assume more importance as a dissipation medium, a point I'll touch on later. Right now I'll take up the different types of calipers and their development, and will follow this with a review of the composition and design of brake discs.

Pioneer research in the adaptation of disc brakes to automobiles was performed by Girling and Dunlop, along near-parallel lines. Both staked their fortunes on *opposed-piston calipers* fixed firmly to the hubs and knuckles, the two opposing wheel cylinders splitting the application force between them and shifting as required to compensate for lining wear.

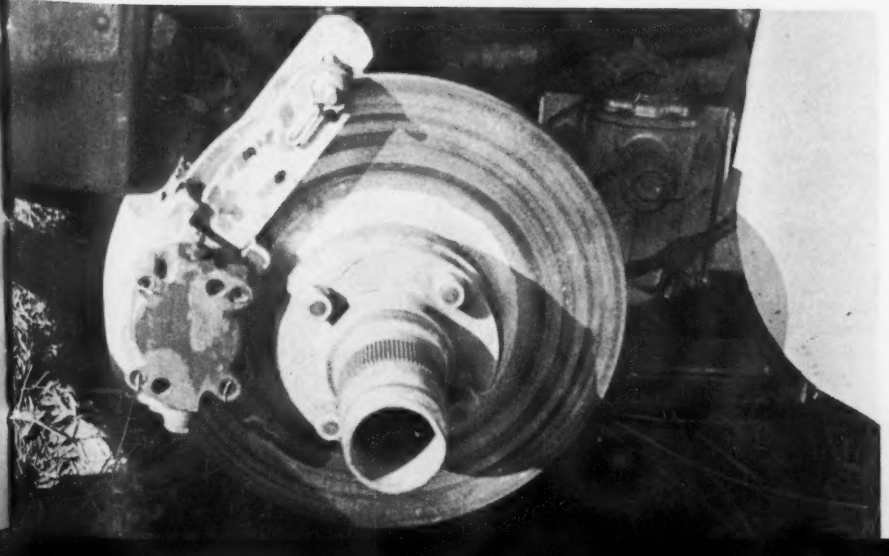
Dunlop's development work depended directly on racing, and particularly on Jaguar sports cars. As early as 1952 Stirling Moss was outbraking the competition in short English events with a C-Type Jag equipped with the then mysterious new retarders, and they were felt ready for Le Mans in 1953, when they cleaned up for Coventry.

Girling chose a similar research route, introducing their discs — somewhat less auspiciously — on the 1952 BRM Grand Prix cars. Calipers of opposed-piston pattern have been used inclusively and exclusively by Dunlop and Girling for all their racing and passenger car disc brakes to date, and as these two are by far the most significant producers of this type of binder, their vote for opposed pistons (as contrasted with a *one-sided* caliper, which applies pressure from one side only) car-

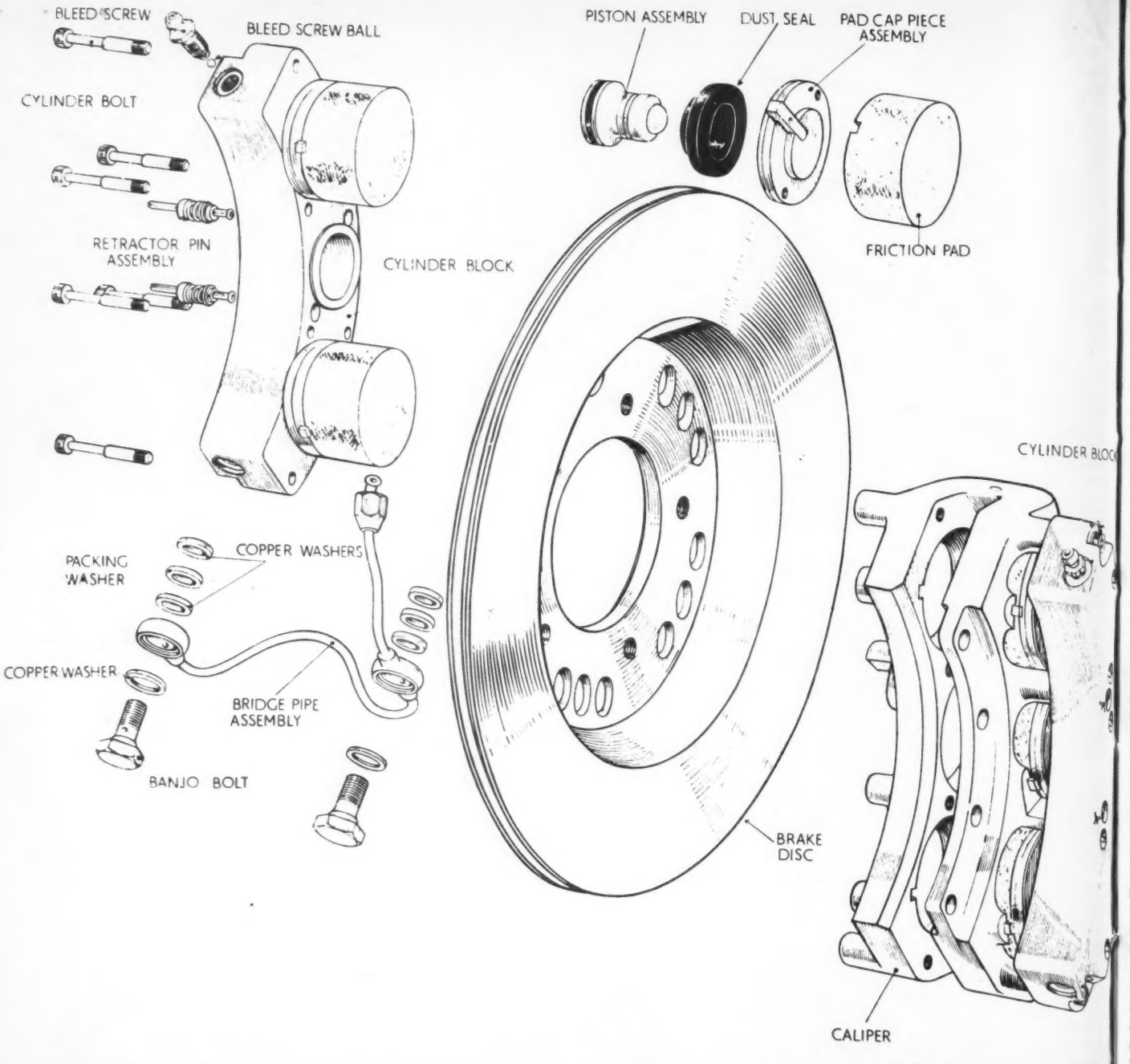




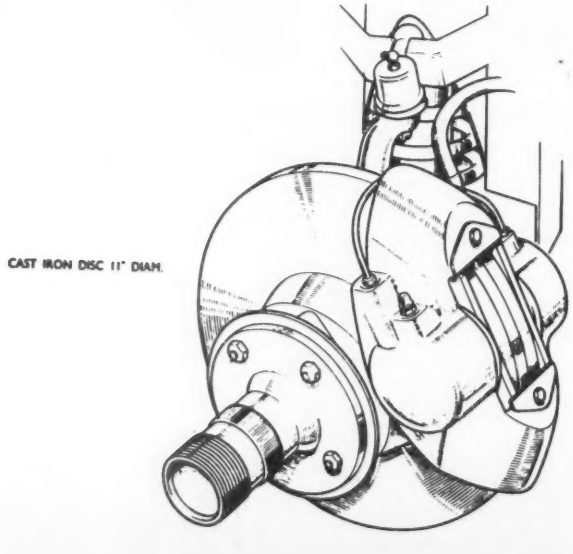
Above left: The latest edition of the Dunlop caliper as mounted on a Ferrari for the 1958 Italian G.P. Rectangular pads are easily changed. Above: Intermediate development stage for Dunlop was a two-pad setup using the rear calipers from D-type Jag. Here shown on 250F Maserati. Left: Girling caliper mounted on an early 1958 Formula I Lotus. The simple triangular clamps used to retain the lining segments are easily seen.



Above: Seen on a production D-type Jag, this 1954 model Dunlop disc displays the damage that can be done when racing in dusty places. Left: Early production example of Dunlop two-pad brake as seen on Austin Healey 100-S. The additional bracket on top holds the pads for simple, mechanically operated hand brake.




Original D-type Jaguar Dunlop b




Girling brake as used on Triumph

ries exceptional authority.

In spite of being primarily a toolroom job and far from inexpensive, the original Dunlop disc brake was built in some numbers, an investment which undoubtedly paid off handsomely in terms of experience gained. They were fitted to the factory C-Types and D-Types by Jaguar in 1953 and 1954, as well as to the production D-Types that started rolling off a special line in 1955. Most of these D-Types are still active today, of course, particularly in the U.S.

These pace-setting Dunlops were designed around the module of a pair of circular pads 2-3/16-inches in diameter. Three pairs of pads were fitted to each front caliper while only two were used at each rear wheel, in recognition of the greater heat loadings at the front.

Carrying 20-percent more lining depth than the C-Types of 1953, the D-Type installations could tolerate up to 13/16-inch wear at each pad, a value that could be read directly from small pointers and scales affixed to the 1954 calipers. Cemented to cap pieces, which are keyed to prevent rotation, the friction pads are actually carried in bores in a medium carbon steel caliper which thus accepts all the braking torques.

Pylons cast in each side of the caliper support light alloy "cylinder blocks", which carry individual cylinders and pistons to apply each friction pad. Each piston has an annular rubber hydraulic seal plus a diaphragm-type rubber dust seal, and contacts the pad cap piece through a very small half-spherical joint. The pistons themselves are small: less than half the diameter of the pads. Being of light alloy the cylinders rapidly throw off heat, while the air space between caliper and cylinders is an effective thermal dam. This intelligent separation of functions is characteristic of Dunlop calipers today, and accounts in large measure for their relative immunity to heat effects.

Another distinctive Dunlop feature, also introduced on these original calipers, is a very simple automatic adjuster which *in principle* can be compared with that used on the drum-braked W196 Mercedes. Each pad cap piece drags behind it two "retractor pins", which repose in holes in the caliper and which can usually be seen protruding slightly from the outside face (when the pads are new).

A tight-fitting bushing slides reluctantly on each pin, and would gladly follow every motion of the pin were it not for a small coil spring interposed between the bushing and the caliper. Compressed by the retractor pins and bushings when the brake is applied, these coils pull the pad from .010 to .015 inch away from the disc when hydraulic pressure is relaxed.

As the pad wears, moreover, on brake application the coils will bottom and cause the bushings to slide along the retractor pins, thus supplying the retracting springs with a new point of reference. In this clever way, pad retraction and automatic wear adjustment are simultaneously supplied. It must be appreciated, of course, that automatic compensation for wear is indispensable to the disc brake, whose small-area pads will erode — in terms of thickness, not volume—much more quickly than drum brake linings.

In these pioneering days there was much dissention (there still is) over the proper positioning of the caliper. Dunlop laid one sensible ground rule when they placed the pads on the horizontal centerline of the hubs, the point where they'd be least affected by out-of-plane movements of the disc under heavy cornering stress. They also consistently mounted the calipers at the rear or trailing edge of the disc, excepting the leading-edge mounting of the front calipers on the 1953 C-Types.

This distinction will be discussed more fully later. It should also be mentioned that round friction pads are logical and easy to mount, but that in extended use, as in production cars or long sports car races, they will tend to abrade the center of the rubbed disc surface fractionally more than the edges.

When the Owen-BRM organization bought a 250F Maserati for testing and experimentation in 1954, they decided to equip it with Dunlop discs. Thanks to the light weight and exposed wheels of this Grand Prix car, the Dunlop boys found that the two-spot calipers, as fitted to the back wheels of the D-Type, would handle the job very nicely at all four wheels of the Maser.

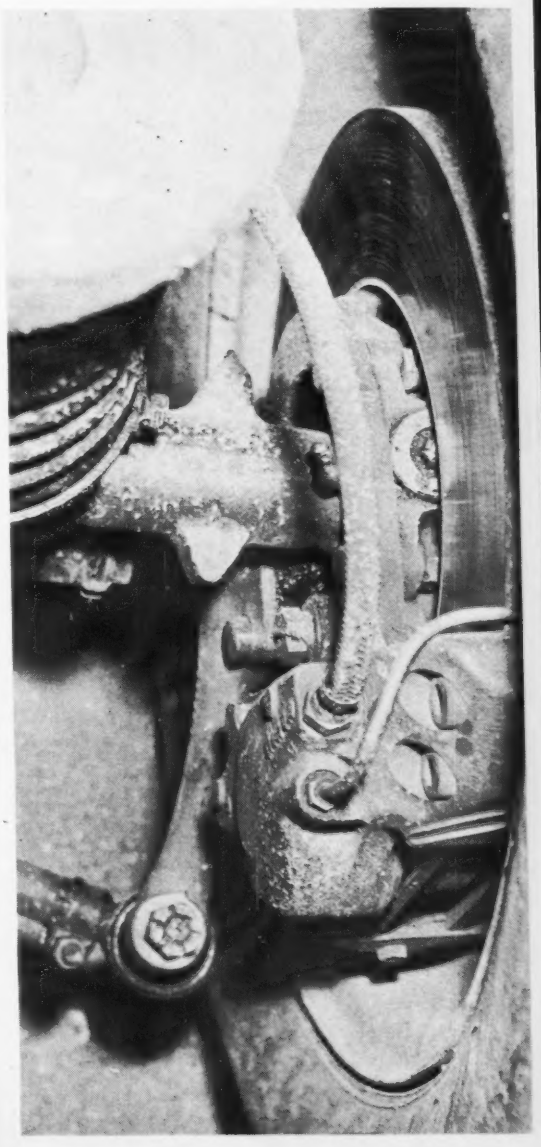
In 1955 a similar system was adapted to Stirling Moss' 250F by Alf Francis. This would seem like an ideal opportunity to compare discs with Maserati's own very good drum brakes, but unfortunately neither of these cars had access to the latest factory engine modifications and could thus seldom keep pace with the crimson team cars.

As pad materials improved and know-how was accumulated, Dunlop was able to create a simpler single-spot caliper — easier to build in large quantities and lighter at the wheels of racing cars. An early machined-all-over experimental installation was made on the prototype four-cylinder BRM's of late '55 and early '56, while the 100S version of the Austin-Healey had the honor of introducing the "production" interpretation, also in 1955. It differed from the BRM unit in many details but mainly in the use of castings for the detachable cylinder blocks.

Appropriately Jaguar tested the next major Dunlop change, on the front wheels of their D-Types for Le Mans of 1956. The U-shaped caliper was "split open" to allow quick insertion and removal of new rectangular friction pads, keyed to the pistons to allow the retractor pins to do their job. At Earls Court that year Dunlop initiated a serious disc brake production program which has since included several sizes of calipers with either round pads or the rectangular quick-change variety. Their latest development in this series interests us here only because it's incorporated in the set of discs that found their way from Jaguar to a Ferrari 250 Roadster to a 246 Dino Grand Prix car, and because it will be found in any Dunlop calipers used in '59 racing (by Ferrari and BRM, at least).

Always vulnerable to dirt and rust, the twin exposed retractor pin assemblies have been superseded by a single pin anchored to a flexible diaphragm at the end of the cylinder bore, and protruding into a hole in the center of the piston. Through a set of the familiar tight-fitting bushings.

Above: With the outer friction pad removed, the two outer cylinders can just be seen within the Girling-Ferrari caliper. Inner block seems to have one piston. Below: A recent Girling move has been the development of a special heavy-duty caliper, mounted here on the front of an Aston Martin coupe. Caliper here is made in two halves, both cylinder bores are thus dead-end.



this spring-mounted pin pulls the pad away from the disc the required amount after each application, the bushings sliding along the pin only when adjustment is in order. It's a very clever adaptation of the original idea.

Since Dunlop and Girling both eventually submitted equipment for evaluation, it's of no mean significance that Ferrari chose Dunlop *freni a disco* for his 1959 racing machinery. The basic calipers used by Enzo so far have been Dunlop production quick-change type, with specially-machined cylinder blocks, and they seem to be working out very well. It's provocative that the *Commendatore* has thus far rejected discs altogether for his GT cars, on the ostensible grounds that they call for a more "delicate" touch on the pedal than the average Ferrari buyer would be able to apply.

On the contrary BMW is keenly interested in fitting discs to all their V8-powered cars, their designers being especially impressed by the "even, balanced" performance of the Dunlops they've tried on a 507. I tend to side with the latter and with the overwhelming, albeit chauvinistic, English consensus.

Although they lost out in Maranello (at first reports), Girling Ltd. can survey without embarrassment a diversified production disc brake program plus satisfying racing ventures with such cars as Aston Martin and Lotus. In their first, pioneering Grand Prix attempt, however, they were harassed by an insuperable jinx: that of the V16 BRM. Girling retired their own well-engineered three-leading-shoe drum mechanism (see Part I) before the 1952 season in favor of highly experimental discs.

Establishing a Girling tradition, the caliper proper and the actuating wheel cylinders were all carried in the same casting, the opposing cylinder bores being formed by a dead-end boring operation right through the caliper with the remaining opening — on the inboard side — sealed up by a screwed-in cap. At each wheel the BRM calipers had three very small (about one inch) cylinder pairs pressurizing very adjacent round pads of a like diameter, the fluid being admitted at the center cylinders and bled, when necessary, at both of the two end pairs. This was one of the few recorded instances, moreover, that all calipers were affixed at the *top* edges of the discs, contrary to the later-formulated Dunlop dictum mentioned earlier.

In this early brake the friction pad and the actuating piston were literally back-to-back in the same caliper bore, with the inevitable result that the brake fluid was overheated to the point of vapor lock whenever the going got especially rugged. Hapless BRM drivers grew used to having the binders seize on solid and send them into gyrations that were too often dismissed by the press as "cockpit trouble".

Fangio saved one such situation when chasing Moss in a like BRM into a tight hairpin on the Dundrod circuit, storming into the bend tail first, calmly glancing over his left shoulder! Not being able to rely on the Old Man's skills forever. Girling engineers did their best to mitigate this failing while keeping the simple cylinder-cum-caliper layout and, in general, the same construction method.

They developed the now-familiar boat-shaped Girling caliper, embracing nearly 90 degrees of the rim of the disc, and housing a single large pair of cylinders. The pistons within are top-hat-shaped, the flanges at their open ends contacting the metal backing of the friction pads, leaving a deep air space as insulation 'twixt the pads and the fluid.

Here again a transition was made away from round pad shapes, the final outline being a truncated pie form that corresponds perfectly to wear requirements and seems to be unusually effective at scraping water away from the disc surface. The open-faced mounting of these pads makes them naturally quick-changeable.

Already straightforward, the Girling calipers are further simplified by the omission of any kind of retraction or adjustment apparatus. Girling's "Hydrastatic" master cylinder system, originally introduced for two-trailing-shoe brakes, cleverly keeps just enough fluid in the lines between applications to hold the pads right next to the disc.

If the brake mechanism had any tendency toward self-application, like the 2LS drum system, Hydrastatic with its occasional contact between lining and rotating member would lead to inadvertent locking, but with discs it's perfect. A slight amount of natural disc runout suffices to tap the pads away from the moving surface. But not *too* far away, since that can lead to unwanted pedal travel.

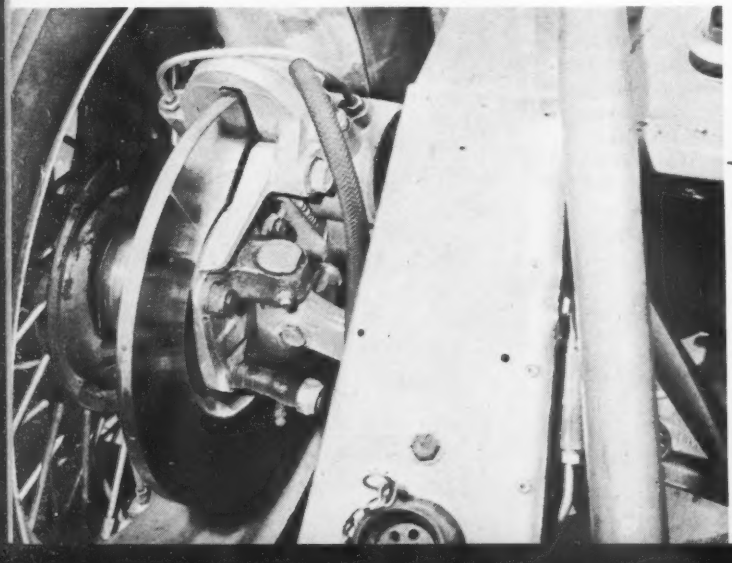
For use in racing sports cars these calipers are cast of aluminum, which naturally gives best possible heat capacity and dissipation at minimum weight. It's remarkable only that Girling were able to make it stand up to the radical stresses that a caliper must endure, without increasing the sections over those of a ferrous caliper. Accomplishment of this meant that an earlier tendency to develop a spongy pedal under racing conditions was largely eliminated, but the best possible brake fluids are still mandatory.

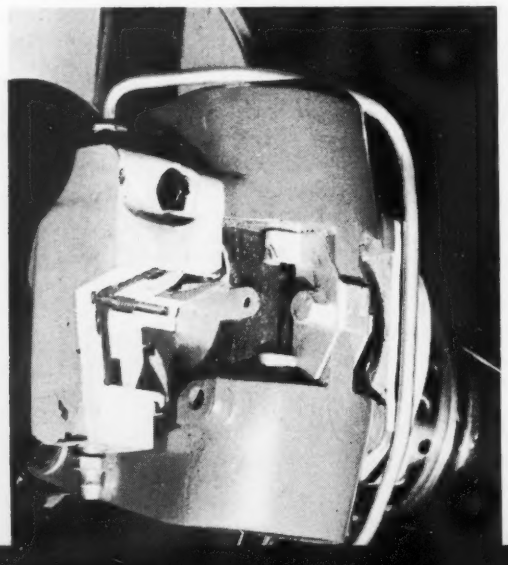
Girling discs have been used in racing by many British firms, but the most important have been Aston Martin, Lister, Lotus and Cooper. In almost every case the calipers have been mounted at the disc trailing edge, or at the point where braking reaction will tend to "lift" the caliper and its attached wheel spindle — thus countering the normal wheel bearing load. Lotus and Lister mount them inboard at the rear, while Aston bucks the trend with an outboard placement there, at the leading edge.

Interestingly, Colin Chapman tried the usual trailing edge position at the front but found that this "lifting" reaction tended to set up a cyclic vibration within the admittedly small limits of the front wheel bearing play, and he consequently changed to a near-leading edge placement. Brake behavior is more consistent with no apparent ill effects to the wheel bearings. The same change has been made on Jaguar's latest disc-braked car, the Mark IX, which may or may not be meaningful. If they do it on the E-Type it definitely will be.

Oddly, the Girlings submitted to Ferrari for evaluation were a totally new departure from their constructional norm. The lining segments are the familiar pie-shape, but they're applied by separate machined cylinder blocks housing (unless my eyes deceive me) two small cylinders outboard and one larger one inboard. These blocks are bound together by two U-shaped steel brackets embracing the disc, making up the end pieces of the caliper.

Completely a toolroom job, they made only one race appearance on the coil-sprung Dino chassis in the G.P. of Morocco, and were later tried on the 1959 Testa Rossa prototype. They may be a hint of things to come from Girling, but their construction would seem to be susceptible to strains that could distort the actuating cylinders. They didn't pass the eye of Ferrari designer Chiti, anyway.





**Far left: An early Girling application on a 1956 Lotus Mk XI uses an alloy caliper mounted near trailing edge of disc.**
**Left: A graphic view of the latest Dunlop mechanism is provided by this cutaway brake. Flexibly mounted retraction pin with its surrounding bushing is at center of incision.**

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## *Enzo Ferrari*

*(Continued from page 23)*

to Ferrari taking a cut of their price to the customer. All these troubles pale when compared to the Pirelli epic.

Early one week Pirelli announced that it was no longer giving the usual 12 to 25-percent racing discount on its tires; starting immediately all purchases, including Scuderia Ferrari, must pay the retail price. This was a serious blow to the Ferrari financial struucture; in order to survive without the subsidies of a huge production car division or a private fortune, Ferrari had come to depend on contracts with suppliers. Two recent examples show how important he considers these contracts: Tests at Silverstone in 1958 showed the new Dunlops to be quite superior to Engleberts, but Ferrari refused to switch until the Englebert contract had run out. Last March at Sebring Ferrari flatly refused to race unless the Shell contract could be observed.

Under the circumstances it is hardly surprising that Ferrari lost his temper with Pirelli. Adding to his anger, and probably a factor in Pirelli's decision, was the fact that the tires had been giving trouble. One had blown out on Count Marzotto's Mille Miglia car, nearly causing a serious crash, and a few miles up the road a tire on Castelotti's car had lost a tread.

Ferrari fired off an announcement that never again would he use Pirelli tires. Then he turned around to face the prospect of racing his cars on the rims. Mercedes had an iron grip on Continental who had no intention of supplying its chief rival. At that time Dunlop's nationalistic fervor was stronger than its sales department and so the firm declined to have its tires used against British cars. Michelin felt approximately the same way and it was too late to set up a contract with a U.S. firm. With a race the next weekend staring him in the face Ferrari turned to, of all persons for an Italian to ask for assistance, a woman.

Belgium was one of the few European countries which hadn't thrown up a tariff wall in front of Ferrari's GT's and the Princess of Rhety had become one of his best customers. Ferrari made his plight known to the Princess and by nightfall Engleberts were on their way to Maranello. Ferraris dark mood concerning Pirelli turned even blacker when Englebert of course made great publicity of the fact Ferrari was racing on Belgian tires. Ferrari is a great waver of the Italian flag and he bitterly regretted being forced by an Italian firm to go outside the country for his main supply.

When the season ended Ferraris had won 93 races all over the world, but 92 of them were minor events and of no financial help to the factory. Only one major race had been won by a Ferrari: The Grand Prix of Monaco (ironically, that was the last time a Ferrari won there).

On the subject of victory and defeat Ferrari can speak in a very philosophical vein: "When I enter a race I do not think of my competitors. I don't say to myself I must beat Mercedes or Maserati. It is the technical result of a race that counts." The technical results of the 1955 season were apparently very bad; or, and more to the point, Ferrari hates to lose and literally cannot afford to lose since prize money pays a large part of Scuderia Ferrari's expenses. At the close of the season Ferrari shook his organization from bottom to top. Racing Manager Nello Ugolini was given his walking papers (he walked into Maserati and took the comparable job); Maserati's chief engineer, Vittorio Bellenta, was hired; all team drivers with the exception of Castelotti were fired; Fangio was picked up from Mercedes; free-lancer Peter Collins was signed and another attempt was made to add Moss.

This brightened the prospects for 1956 but it had no effect on the empty cash register. Ferrari swallowed his great pride and made a public appeal for support. "It is Italian engineering and artisanship that wins on the track when Ferraris win," he said. "I have problems which the Germans do not have. While for them their cars are representative of the nation and the maker benefits from their help and cooperation, I often have to worry about how to meet my men's wages. Workers and Italian emigrants send me letters of appreciation and congratulation from all over the world. That is most comforting." But, Ferrari went on, that wasn't paying the bills.

He definitely was not looking for help from the government. As he said later, "It is good that we have no government subsidy. If we had the state as a master then where would we be? It is better to have no master and to rely on oneself." At that dark hour in 1955 Ferrari was relying on the sympathy and generosity of Italian industry.

The response on the whole was a shattering silence. Most Italian industrialists felt they had no more business supporting Ferrari than he had boosting their motor scooters, shoes or movies. However, Lancia turned over all its racing cars (ostensibly of dubious value since they had won but one race all season) and Fiat contributed 50 million lire (80 thousand dollars). Fiat's 50 million perhaps meant the difference between life and death for Ferrari Automobili and it is no coincidence that Ferrari's personal car is a Fiat 1200 coupe and all Ferraris travel in Fiat transporters.

Thanks to the 50 million lire and the revamped Lancias, 1956 saw Ferrari firmly in the win column again. The most comforting victory was the incredible quintuple in the Mille Miglia, a record not likely to be equalled in any motor race. But the return to racing triumph was overshadowed by personal tragedy. Ferrari's 28-year-old son Dino, the hope for the creation of a dynasty, died in late June. Dino was Ferrari's only child and even taking into account the traditional Italian love for children, Ferrari was very devoted to his son. Dino's death was a terrible blow and coupled with the fact that Ferrari's wife is often ill, it greatly increased his natural inclination to stay near home.

When I asked Ferrari to name his greatest disappointment in racing he replied, "There have been so many, too many, and I could not single out one. I feel lost against the cruelty of destiny." The 1957 season contained two of these racing sorrows. Almost before the season had begun Castelotti died in a car intended for Sebring, the second Italian driver to die

at Monza testing a Ferrari. Sebring and victory passed and it was time for the Mille Miglia.

The Mille Miglia was Ferraris favorite race. As a young man he had followed it passionately as the cars hurtled through Modena and later he had raced its gruelling length himself. "The Mille Miglia costs nothing to look at. It is the race of the people," he said before the 1957 race. "One may say that the whole of Italy leans forward with her eyes on the tarred strip of road somewhere along the course on Mille Miglia Day. It is a day when I feel my life is useful, that I am accomplishing something." Toward the end of that day a Ferrari driven by the Marquis de Portago rocketed off the road into a ditch and burned, killing Portago, his companion, Edward Nelson, and 10 spectators.

Long before the race there had been loud rumblings in the Italian Parliament and press about abolition of the event. In virtually every running of the race at least one driver or spectator had been killed or injured. Portago's crash resulted in even greater publicity than the Le Mans disaster. Portago was one of our era's most romantic figures and great newspaper fodder; there was even something for the movie magazines since Fon's most recent conquest was supposed to have been Linda Christian.

Italy's Parliament and press opened up with both barrels. A successful bill to outlaw the race was whipped into shape and Ferrari was attacked with great vigor. All his Mille Miglia cars were impounded by the government with accompanying hints that they were mechanically faulty.

Although extremely sensitive to press criticism, Ferrari has always refused to be drawn into polemics with his critics, critics whose harshness would surprise Americans who consider him to be almost sacrosanct in his own country. But nearly two months after the Portago crash when officials were still trying to find something wrong with his cars (they never did), Ferrari jolted the racing world by withdrawing his cars from the Grand Prix of Italy at Monza. This set off new press attacks and Ferrari replied that "We shall never again race in Italy." Along with Ferrari brakes and suspension the officials had been examining Englebert tires. In a statement supporting Ferrari's "withdrawal," Englebert said that in view of the impossible atmosphere created by Italian authorities they would supply no more tires for Italian cars in Italian races.

The next season, 1958, Ferrari automobiles were racing in Italy and racing on Englebert tires. This caused some consternation among those who back in July had mourned the passing of Scuderia Ferrari and Englebert in Italy. The Englebert explanation is simple: Their statement had been made at Ferrari's prodding and if the *Commendatore* had changed his mind then Englebert would be only too happy to supply the tires.

The workings of a man's mind are his private domain and Enzo Ferrari is not given to making excuses or explanations. But it will help to understand this incident, and an exactly similar one a year later, if one remembers that Ferrari is not

*(Continued on page 78)*

## *Enzo Ferrari*

*(Continued from page 77)*

an American who happens to speak a foreign language fluently and lives in southern Europe. He is an Italian and Italians have different ways of doing things than the stolid Anglo-Saxons. An example is an Italian strike. American bus drivers and auto workers walk off the job, march up and down in front of the plant with signs and don't go back to work until they get their raise or get very hungry. Italian bus drivers and auto workers make ringing declarations for the press about the dire need for a raise, march home, sit around drinking or fishing for a day and go back to work the next day. In that area below Switzerland, the *gesture* is of considerable importance.

For both triumphs and tragedies, 1958 was better and worse than 1957. Mike Hawthorn became Ferrari's fourth yearly world champion and Ferrari won its sixth sports car championship in a runaway. And Luigi Musso and Peter Collins died driving Ferraris, in accidents of such a nature that even Ferrari's defenders wondered if perhaps there was something inherently unsafe about his cars.

Ascari's death had been so spooky, he apparently had lost control on a straight at a fairly slow speed, that it seemed in a way divorced from normal experience. Castelotti, an erratic driver, was supposed to have crashed as a result of a flagrant error of his own — missing a downshift. Portago probably blew a tire which was bald of his own choosing. But both Musso and Collins died driving cars in normal condition through high-speed bends they had taken many times before. There was a chance Musso had been groggy from nitro fumes gulped at the Monza "500" a week before, but it seemed like a long shot.

Some said Ferraris had been so perfected that drivers lost the natural feel of the car and were apt to overestimate its capacities. Others said that although the FI cars were smaller, lighter, had less cylinder capacity and power and handled better than the cars of 10 years ago, the drivers were more reckless, trusted their cars more and took curves at too high speeds. Still others claimed Fangio was at fault: Drivers were trying to drift high-speed bends as he had done but without his superhuman judgment.

The Italian press was in full howl. It went as far as to charge Ferrari with building death traps which were wiping out the world's best drivers and, more criminal yet, had killed every one of Italy's first rank drivers.

Ferrari replied, in a rare press conference in December, that "After the tragic incidents in regard to which the Italian press has inflicted grave moral condemnation on us, we asked ourselves, together with our technicians, if we had actually overlooked something that might have caused disasters. But we came to the conclusion that we had done everything humanly and technically possible to prevent and avoid any incident whatsoever. There was a time in Italy when races were highly exalted, then merely tolerated. Today they are virtually on the Index. I no longer feel at my age like continuing such a battle. That is why I say we will no longer race in Italy." (Ferrari has already raced in Italy this season.)

Why all the deaths? Ferrari himself blames the circuits, charging in particular that retaining bankings have not been modified to cope with higher racing speeds. But the fact remains that the death toll of Scuderia Ferrari is higher than for any other equipe. Whether today's FI cars, and Ferrari's FI cars in particular, are inherently unsafe is a question which seems impossible to answer.

But in all the wild shellfire one simple fact seems to have been overlooked: race driving, especially highly competitive race driving, is a very dangerous occupation; death is an occupational hazard. Scuderia Ferrari hires the most competitive drivers; as Ferrari says, "The results of a race are only due 50 per cent to the car. When you have created a car that can win you have only come half way. The moment has come to find a driver." Even in the select world of GP drivers there are many "strokers" who never take big chances, never win many races and live to a ripe old age. Of the very few drivers, Fangio is the outstanding example and Tony Brooks the best active one, who have had the ability to drive very quickly without taking big chances. But in the main it is the "chargers" who finish near the top by taking the chances, sometimes fatal chances. Ferrari, which must win, has employed more than its share of "chargers" and consequently has had more than its share of deaths.

Although most certainly aware of the pressure to win, Ferrari drivers in general have quite pleasant relations with the *Commendatore*. He seems to understand their position since, as he puts it, "It is easier to interpret a part of life when you have lived the same part, whether for passion or for necessity." However, the drivers definitely feel they are employees, not collaborators. There is no togetherness in Modena and the ties between drivers are purely personal friendships.

Ferrari's attitude toward test driving and actual racing acknowledges the pressure that exists. His daily routine usually consists of working at the Modena office until 3 p.m. when a combination chauffeur-office guard drives him to Maranello where he stays until 7. But quite often he spends the late morning at Modena's combination airport-auto circuit taking a commanding interest in tests. (He occasionally tests a GT himself but never a GP or sports car.) He believes he must supervise the testing but it is virtually front page news when he appears at a race. One reason for this unusual abstention is personal: Since his son's death and his wife's illnesses he has felt an even stronger desire to stay near Modena.

Two more reasons are professional: "I suffer badly when I see one of my cars not go as well as it should or when a driver risks himself too much. It seems obvious that my presence would cause embarrassment to the drivers and mechanics." These men are acutely aware that Racing Manager Romulo Tavoni has detailed

*(Continued on page 83)*

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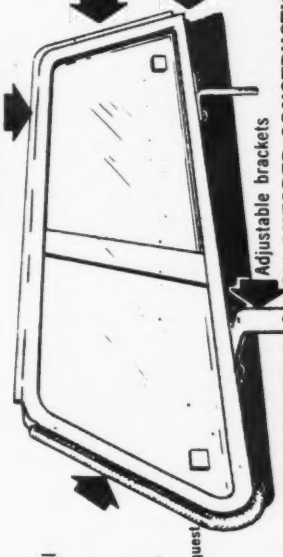


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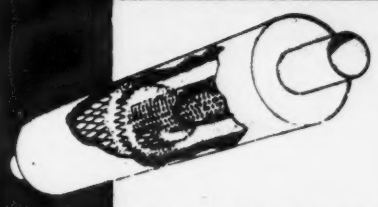

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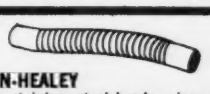

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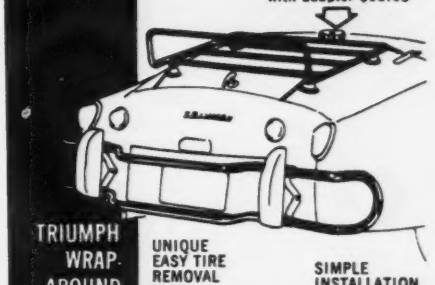

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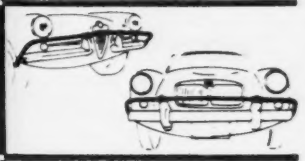

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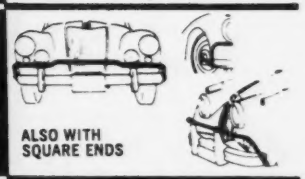

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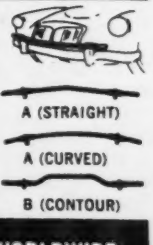


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### *The Races He Never Won*

*(Continued from page 67)*

probable field to three Ballots and a single Mathis.

The only means of getting the Duesenberg cars into the race was by securing a delay of twenty-four hours for the funds to be cabled from America. René de Knyff, who had handled Panhard cars as far back as 1895 had been chairman of the French racing board for more than twenty years. Hard hitting, blunt spoken, as impartial as the rain, he had never been known to take advantage of his position or in any way to favour the firm with which he was connected.

The A.A.A. man laid the case before him. "Your 1921 Grand Prix is likely to be the Grand Failure. Three Ballot cars are certain to start. The little Mathis is a joke. Fiat will not appear, and a miracle will be necessary to get the Talbot-Darracqs to the line. You would make yourself ridiculous if you ran your great race with only three cars of the same make. Now, if you will only grant me twenty-four hours delay to get the funds together I can enter the finest team America has ever produced, with the best drivers, men capable of meeting the finest European talent."

The French chairman listened in silence. He cast a glance around the magnificent Place de la Concorde, then after looking up at the ex-royal palace in which the club was housed remarked quietly: "You might just as well ask me to set fire to the building."

Doubtless the Duesenberg brothers were disappointed at not having gotten into the race, but they decided to pay double fees and make an entry not of three but four cars, two of which were to be handled by Jimmy Murphy and Joe Boyer.

Ernest Ballot's enthusiasm for Ralph de Palma had not been shaken by his failure to win at Indianapolis a year earlier. Now he was bringing him to France, and on French soil, with the finest car in the world and the world's best driver, he was certain to win. It was logical. Ballot agreed that the world's finest driver could not stay anywhere but at the world's finest hotel, the Crillon, on the Place de la Concorde, the only one on that magnificent historic square, the rendezvous of crowned heads and world diplomats. Ralph's smiling dignified geniality immediately marked him out as No. 1 Guest, but when he remarked to the head waiter "You know I'm a Wop," the whole staff was anxious to serve him. If a simultaneous call came from the American race driver and from the British Prime Minister, it was the "Wop" who was attended to first.

Down at Le Mans, on a triangular track, one leg of which ran by the racecourse from which Wilbur Wright had made his first public flight thirteen years earlier, practice was in progress for the French Grand Prix. Inghibert, a French amateur, had bought himself a position on the Duesenberg team, but soon realized that he was not equal to the professionals. To improve his style, he asked Jimmie Murphy to go with him as riding mechanic and give him hints. The result

was disastrous, for the Frenchman overturned the car on a bend. Murphy was lifted out with suspected cracked ribs, the chassis was bent and Inghibert's confidence was shaken to such an extent that he decided to quit racing for ever. Immediately André Dubonnet, a wealthy French sportsman, stepped into his place. Albert Guyot was given a car, the American team comprized two American and two French drivers. At the Talbot-Darracq factory the unexpected miracle had occurred and all four cars were on the spot, two of them being painted green and entrusted to Segrave and Guinness and two of them under a coat of blue paint handled by the Frenchmen André Boillot and René Thomas.

But the centre of attraction was the Ballot team and the manufacturer of the three cars made it known that the race could not be won by any other man than the invincible Ralph de Palama. The last practice day had come and Ballot and Engineer Henry had stationed themselves on the Mulsanne corner to note how the drivers took the right-angle turn from the fast straight leg to the narrow and winding road through the pine woods.

Ralph de Palma made no claim to have invented an automatic transmission, but he had worked it out that if the mechanic could shift gears for him, leaving him free to keep both hands on the steering wheel, he could gain six minutes in a 300 mile race. It was only a matter of synchronisation. On a given signal, indicated by a lift of the thumb, Peter de Paolo pushed the central gear lever into third, second, first according to conditions, or up again from first to fourth, without any interruption in the flow of power, and with greater rapidity than if the job had been done by the driver himself. Working in perfect harmony, both men were pleased with the scheme and knew that it gave them an advantage over other drivers.

On that last practice day Pete de Paolo must have been overcome by nervousness as he caught sight of Ballot and Henry at the roadside, for instead of a clean entry into second gear, he touched reverse for a fraction of a second, with a consequential howl of protest from the gears.

But another and greater howl went up from the roadside. It emanated from Ernest Ballot who realized that the mechanic was guilty of the crime of shifting gears on the car he had built and entrusted to De Palma. Now he realized why the American had insisted on the lever being moved from the usual right-hand position to the centre, on the top of the transmission housing. It was sacrilege, it was unforgivable that any driver should interfere with the design of the car he had built and should have the audacity to transfer a part of his functions to his mechanic.

The race was only twenty-four hours away, but the lever was put back to its proper position, although it involved working all night. De Palma started in that race with no enthusiasm. The right-hand gear shift made the car strange to him. Instead of cheerful tolerance for Ballot's foibles, the man now irritated him, became obnoxious, almost an enemy.

*(Continued on page 82)*

## *The Races He Never Won*

*(Continued from page 81)*

Jimmie Murphy was tightly bandaged from shoulders to waist. He was in pain, but that was not going to prevent him doing his best to win the Grand Prix. If the Talbot-Darracq cars had come to the line in an untried condition, the four drivers soon discovered that their greatest handicap lay in their completely unsuitable tires, which melted like butter under the sun. The men in the pits worked harder than the men at the wheel, fitting and inflating tire after tire and then borrowing from other competitors. Not infrequently two of them were in at once for tire changes, spreading over their allotted space into the Duesenberg land and causing Duesie's team manager, George Robertson, to curse loudly.

To the undoing of all, much of the road went to pieces in a manner never before known in road racing. Machine-gun-like volleys of stones rattled on body panels, tanks and radiators and hit the drivers and mechanics with cruel impact.

De Palma's gasoline tank was punctured. This was a sufficient reason for dropping out, but professional pride, backed by the urgings of De Paolo and the noisy encouragements of the pit attendants caused him to continue chasing Murphy's Duesenberg, fifteen minutes in the lead. But the plucky Irish-American was by no means in a happy condition. A flying stone had punched a hole in his radiator and he knew that he had precious little water left. An engine will run a long time without water but if it is stopped it will not start again — at any rate not for a long time and after infinite precautions. Ignoring his pain, refusing to admit the physical punishment he was receiving from the pitted and strewn road, Murphy pressed on and after rather more than four hours at the wheel, was the first American on an American-built car to win the coveted French Grand Prix. If De Palma brought the Ballot into second place, the fifteen minutes gap between it and the winner made the performance of little account.

Ballot's public crying against the fates in the town square the night after the race can easily be understood. However, the old adage that there is a wise guy in every crowd was just as valid in France in 1921 as it is in the States today. From the edge of the crowd Albert Guyot, who had driven for Ballot at Indianapolis, trumpeted, "I only know of one winner in any race, and it is the man who gets home first."

A laugh went up and the crowd melted away.

*—wfb*


"Now how do you suppose that happened?"

### *Enzo Ferrari*

*(Continued from page 78)*

telephone or cable communications with Ferrari at the conclusion of practice sessions and the race, but that's not the same as having the *Commendatore* sitting on the pit wall.

Ferrari's second professional reason for staying at home might seem a trifle strange to those who think only of Scuderia Ferrari and forget about Ferrari Automobili. He doesn't junket around the world with his cars á lá Briggs Cunningham, Ferrari says, "Because I consider my daily work useful and necessary for the life of my firm (Ferrari Automobili). I have very good collaborators who can handle the racing (Scuderia Ferrari). My presence is much more important at the firm."

The 350 GT's that Ferrari Automobili turn out in a year are not prestige-publicity items such as David Brown's Aston-Martin GT's; they occupy a crucial spot on the balance sheet. While Brown can charge off his GT and racing losses to his gear box and tractor empire, Ferrari must not only make money on his GT's but in lean racing years this profit has had to help support Scuderia Ferrari.

Ferrari's delicate financial balance has not endeared him to some customers and race organizers. The price of a GT, especially in Europe, can vary considerably. It's not unusual for a customer's wallet to be assayed and expensive accessories added accordingly. One Roman prince is reported to have found a gilded steering wheel on his car—and paid for it.

The American market is a lucrative one for Ferrari, but it has its problems. Ferrari says the *raison d'etre* of Scuderia Ferrari is "To build cars for champions to win championships in." He would like to carry this princely approach over into the GT division and in Europe he has been fairly successful, picking and choosing his customers. But the greater pool of Ferrari-type money is in the United States, and the necessity to tap it, has meant a number of Ferraris have found their way into the hands of people who in Europe wouldn't measure up to the *Commendatore's* driving and breeding standards. Thse persons have failed to understand their good fortune in being allowed to buy a Ferrari, have expected the same kind of service they get with a Chevrolet or a Renault and gone so far as to complain that the plugs foul at low speeds. (The latter problem is aggravated by the fact that some purchasers take the high speed axle to impress their friends and then drive the car almost exclusively at low speeds.)

The GT division can be made to produce a profit, but nothing like the Porsche, Jaguar or Mercedes earnings. As Ferrari explains it, "The expenses of yearly racing cannot be charged off to the rest of the firm because it is a small firm. The racing expenses must be paid for with starting money, prize money and help from the accessory suppliers." Nobody is more aware of this situation than the race organizers. Ferrari pioneered the practice of starting money and he practices it relentlessly.

*(Continued on page 84)*

## *Enzo Ferrari*

*(Continued from page 83)*

One organizer, after several years of dealing with Ferrari's demands, came to the disgruntled conclusion that Ferrari considers himself the Pope of motor racing.

This is carrying things a trifle far, but there is no doubt Ferrari is, and considers himself, one of the great figures of automotive history. He refers to himself in the grand manner; he is likely to say "Ferrari believes that . . ." rather than "I believe that . . ." There is a great deal of the automotive statesman in his bearing. He is much too experienced a hand to be trapped in the Fangio vs. Nuvolari wrangle: His response to a "who was the greater driver?" question was, "Every period has had the greatest driver. Sportsmen, like politicians, cannot be judged apart from the time in which they lived."

Ferrari also refuses to be drawn into an argument over Stirling Moss, who says he will not drive for Ferrari because all good drivers should not drive for one team and he (Moss) was slighted by Ferrari years ago. When told of Moss' position, Ferrari replied with heavy irony that "For a long time I have considered Moss one of the greatest *'fighter-drivers'* in the world. The reasons for which he declares he will not drive for Ferrari represent his personal truth. But as the truth is a very subjective thing, it is obvious that all of us indulge ourselves in building our own 'truth'."

Ferrari is in some ways similar to his early idol, Henry Ford. Austere and remote, his approach to his customers parallels Ford's reported statement that Fords would be made available in any color the customer wanted as long as it was black. The Ferrari manner also bears a striking resemblance to that of Etore Bugatti. In the way of *Le Patron*, the *Commendatore* exercises complete control over his factory, indeed he IS the factory. He weighs the advice of his associates but he is Ferrari and all decisions of any importance are his personal province. Many an axle ratio has been changed on race eve after a cabled command from Modena. It would be wrong to say he rules with an iron hand; his iron will is quite sufficient.

Ferrari ascribes his success to "the result of a common effort of men who believed in me and worked with dedication." Despite little or no public credit these men are fanatically loyal. One Ferrari critic says this is simply because there is nowhere else for them to work, but this theory skirts the tremendous respect, if not affection, which Ferrari commands.

Bugatti is the principal challenger to Ferrari's title of the only man to make a financial success of automobiles based on speed. However, *Le Patron* occasionally turned out an opulent creation that had little to do with quickness. Bugatti also differed widely from Ferrari in development and testing procedures. Bugatti was fond of new ideas and after creating a new rear suspension he would place it on two sawhorses and have six men stand on it to see if it was sturdy enough.

Ferrari is not fond of new ideas; he switched to disc brakes years after they

were proved superior to the drum variety for racing purposes. His new cars are invariably too heavy and he makes them go faster by subtracting weight only after exhaustive tests have convinced him the subtracted components won't affect the car's durability. This cautious approach, plus Ferrari's fixation with metal fatigue, something Bugatti never heard of, have resulted in Ferraris' present reputation for durability. This reputation was not always so; clutch and starter in the past have given great trouble and the solution was the predictable one involving the addition of weight.

Ferrari views metal fatigue with a horror akin to a driver's attitude toward oil on the course. He fights it with a small but highly knowledgable engineering department in a very modern laboratory, and in test after test on Modena's oval track. The results caused one Briton, not an admirer, to remark, "Once a Ferrari leaves Modena it's ready. If a driver bashes it one Sunday, a mechanic hammers it out and it's ready next Sunday. Our cars often must be flown home. Once a Ferrari leaves the works it can generally be sorted out by a mechanic."

Ferrari is explicit in indicating he spends little time contemplating past triumphs: "It is human nature to discount your past achievements and look forward to new ones, to feel the past achievements will be insignificant compared to what will come." And he is serious in his views that each race is another test: "Motor races were, are and always will be a spectacle with high technical meaning. They are proofs in practice of technical principles which could never be reproduced in a laboratory."

If each race is a test, what is he testing for? Ferrari's ambition, he says, "Is to win the races that have never been won by Ferrari . . . and those races that have not been run."

There are but a handful of current races that Ferrari has not won; two are quickly apparent: The Nurburgring and Indianapolis. A victory at the Nurburgring would be especially sweet if it came over a strong German threat such as Porsche will mount in 1961 and Mercedes seems always on the verge of mounting. It would help ease those memories of the 30's, 40's and 50's. The Indianapolis "500" failures would to a great extent be absolved by victory in the proposed 3.8 liter Intercontinental Formula race there. The scheduled Sebring FI race is a logical target.

During his "withdrawal" press conference in 1958 Ferrari hinted strongly that he would soon give up motor racing. When asked later if he had any plans concerning the 1.5 liter FI ruling, he said simply, "Ferrari will be ready." From this extraordinary Italian with the ordinary name, the latter pronouncement seems suitable for all occasions.

*—s mcn*

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## *Breakfast With Farina*

*(Continued from page 29)*

"The other approach is to build a completely one-off body. If you want it on a Ferrari, Fiat, Alfa or Lancia chassis, we can do it because we're set up for it. If you've chosen a Jaguar chassis, for example, it's out of the question because we are committed two years into the future for this kind of work.

"And it is very expensive at best. If you will accept our design for a body for a Ferrari chassis and if you do not demand any changes during the course of the work, the *body alone* will cost you about $20,000.

"Finally, there is the situation where we do a prototype design for an outside factory. Then we study and modify each part and it is very time consuming. There the initial cost is much higher and, after that, the factory pays us a royalty."

Buehrig asked, "How do you present these designs? In two dimensions as drawings or in three dimensions in clay or wood?"

"For ourselves," Farina replied, "we don't need to model in clay. We make a small sketch which an artist then turns into a full-scale drawing. Then we build a wooden mockup, put the panels on it, check the lines and highlights, make some modifications, then go ahead and build the body.

"When we must show a proposed design to a factory, perhaps American or British, we make it full-scale, in clay, complete with paint and chrome. The factory representatives come and look at it. We probably agree upon some modifications, which we make in two or three days. Then the final model is examined and photographed. The photos go to the home factory and, upon approval, we go ahead and build."

Bill Smith asked, "What are your American commitments?"

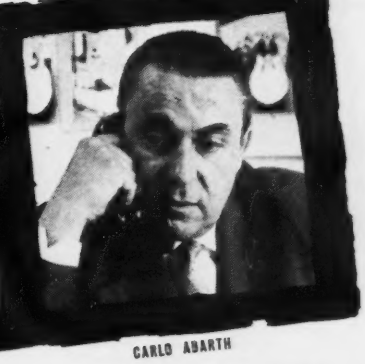
"I had a direct contract with Nash," Farina replied, "but now I am free to work with any American firm. My original relationship with Nash consisted of this: I made a model for the original Rambler. Nash did not accept it. They made their own model for the car and I modified it . . . that was the model that went into production. I'm now doing a new model on the Rambler chassis for AMC's consideration. This is one type of relationship that we have with American companies.

"Another is the one we now have with Cadillac. We are building two cars a day for this firm and the number may be increased to three or four per day. The body was designed by GM, *not* by us, and this is the first time we have accepted such an arrangement. We accepted it because the body is beautiful; it was offered to us, no doubt, because it is so much more economical to build by hand and in small volume in Italy.

"We receive four chassis in a single crate from Cadillac. We save the crates, in each of which one completed car can be returned. The chassis arrive incompletely assembled and we finish the assembly. It's no easy job; each car, for example, contains 73 small electric motors

*(Continued on page 88)*

Factory for the production of the ABARTH cars



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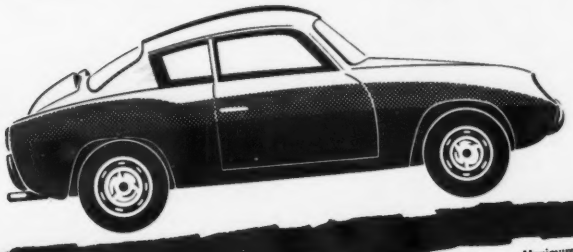

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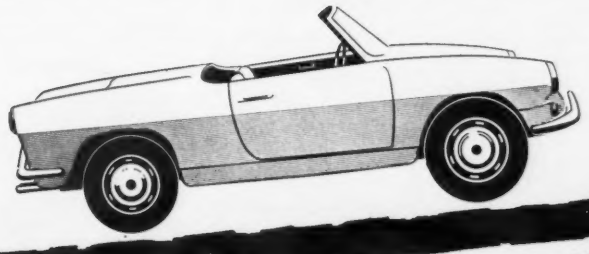
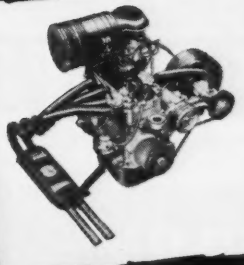


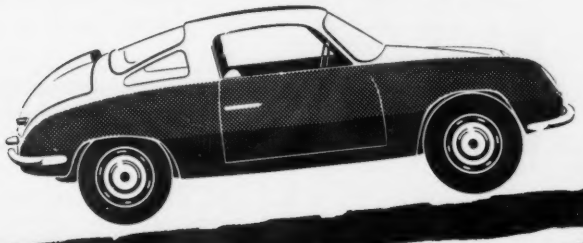
Bore and stroke 61 x 64 • Maximum power 44 HP • Consumption over 39 miles per U.S gallon • Maximum speed over 92 miles per hour



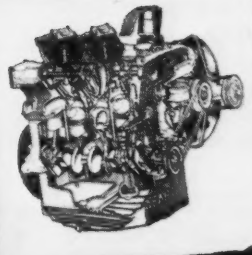
FIAT ABARTH 750 single camshaft

## FIAT ABARTH 750 Dual-camshaft

Record Monza



Bore and stroke 61 x 64 • Maximum power 61 HP • Consumption over 28 miles per U.S gallon • Maximum speed over 112 miles per hour



FIAT ABARTH 750 Dual-camshaft engine exploded view of the engine

# ABARTH

TURIN - ITALY

## *Breakfast With Farina*

*(Continued from page 86)*

for the power-assistance of *everything*. The car is to be released on the American market this summer. We don't know what GM will call this model but we have been told it is to retail for $16,000."

"How about your British connections?" asked Smith.

"It's well known," Farina said, "that we have been working closely with BMC. They have five divisions: Austin, Morris, Wolseley, MG and Riley. We did the Austin body for them and they have made it the body for all five of these cars, changing only the grilles and other minor parts. This is good business since the same dies can be used throughout but it does not make Pinin Farina look good. But the cars are selling well and BMC have told me that they like our work and want us to proceed with the design of other, new models. Each line is intended to pass through a three-year body cycle and I expect to see more diversification in the BMC lines in the future. The current MGA is very satisfactory; we don't expect to get to work on a new MG two-seater for a couple of years."

I then said, "In current automotive architecture on both sides of the Atlantic there is a fast-growing trend toward the adoption of identical styling themes, the greatest differences being in the scale that is used. How do you view this?"

Farina said, "I think that we are passing through a phase. I think it's partially due to a shortage of capable designers. For example, in recent weeks in India, Japan and Australia, I have been asked by auto manufacturers to design bodies for them. I think that, in time, new designers will come to the fore and these countries will not have to look elsewhere for ideas. Then a new cycle will begin. It will be marked by new and pronounced national characteristics in body form."

Buehrig and Smith were in the Southwest to do research on operating temperatures relative to use of plastic body materials. "What materials do you use?" Buehrig wanted to know.

"We use steel when we make at least 500 cars," Farina answered. "We use aluminum for sports cars but it is liable to crack in time; we can't guarantee light metals as we do steel.

"We are just beginning to experiment with plastic and now are making dashboards, hoods and rear-deck lids of this material. We know very little about it, have few people who understand working with it. We will wait a year or two to see how it stands up before we make broader use of plastic. But I do feel that its success in boats and aircraft indicates that we will find it highly useful.

"A lot has to do with the size of the production run. If we were making a small quantity of bodies — one to 200 — it would be easy for us to do this in plastic. For as many as 1000 units can do it more economically in steel, and with no weight penalty. Steel is very satisfactory."

Championship race cars are among Estes' strong automotive interests. He

asked, "Are you doing anything with magnesium?"

"Yes," Farina said, "We use it when it's worthwhile . . . meaning in very high performance cars where every ounce counts. It is very hard to work by hand and it can't be welded. The bodies we built for the Lancia V8 competition sports cars in '53 were of riveted magnesium. They weren't very smooth but they were light and they were very correct aerodynamically. We made the bodies for the current Abarth streamlined record machines. They are quite smooth in their finish but that is because we made them with dies, not by hand. Interestingly enough, in spite of the brittleness of magnesium and the body wall thickness of only 28 thousandths of an inch, one of these cars has done at least 20,000 miles on the track at high speed and no cracks have appeared."

The Ford men wanted to know, "What kind of dies do you use?"

Farina said, "We use steel dies. We want to use plastic ones but don't yet have that technique. It is possible for us to show a profit by using steel dies on a production run of less than 5000 units; for you that probably would have to be at least 100,000 units. Labor cost is not the only factor here. In the U.S. you have very, very busy, complicated sheet metal shapes. The required dies are complex and costly and it is difficult to form the metal in them. But in Europe we strive for simple shapes that require simple dies and that are easy to form."

"What do you feel the future holds for aerodynamics in passenger car design?" I asked.

"American cars, with their immense horsepower, create little need for the use of aerodynamics. Consider the air inlets to the radiators and engine spaces of American cars: they may look attractive but are opposed to good aerodynamic principles. Still, it doesn't matter. But for the smaller engined European car and the high cost of gasoline in Europe, aerodynamics is vitally important. Therefore we make very careful wind tunnel studies and we apply our findings even to the Ferrari road machines. We can't apply all that we learn but we do put from ten to 50 per cent of it into our cars."

"What are your criteria for judging a piece of coachwork?" Thoms asked.

Farina answered, "In my life I have always been concerned first with line and form. Next, comfort. Next, aerodynamics. But I have no method for judging these things. It is something I see and do without any method."

"And what cars in history, according to your judgement, do you consider the most beautiful or perfect?"

"That is a bad question," Farina said. "The long, narrow car of prewar years had the elegant lines of the greyhound. The wider, shorter postwar car has more the build of the bulldog . . . which also is a *beautiful* animal. You can't compare them. They both belong in the world.

"If you ask me what is the best car I have designed in my life I will answer that I have five grandchildren and two children. I love them all the same. And all my designs, they are my offspring, you understand."

—*gb*

## *"Ca C'est Le Mans"*

*(Continued from page 63)*

this time one of the mechanics improvised a lever out of a piece of pipe. Dan said this worked fine, but then head light troubles dropped him back still farther. Finally the car blew its engine after Behra took over.

As one French newspaper put it, the 1959 Le Mans race can be divided into three acts: the first: "Behra against Moss", the second: "The reign of Gendebien-Hill", the third and last: "The rewards of DB and Aston-Martin". This just about sums up the actual race and there is little point to go into a lap by lap account at this late date. In the beginning, it was indeed Behra against Moss, until the Ferrari family sailed by the Aston on the Mulsanne straight. The Ferrari had been pushed hard all the way, as had the Aston, but once Behra passed, Moss slacked off considerably and the race average dropped.

The Hill-Gendebien car was put into the lead shortly after midnight when Behra and Gurney retired, and it led the Aston-Martin up until approximately 11:30 that morning when Olivier Gendebien noticed the water temperature slowly rising. Soon it was off the clock with an obvious leak in the engine itself, absolutely nothing to do but to retire. With a tired, disgusted look on his face, Gendebien climbed out from behind the wheel . . . allowing the Salvadori/Shelby Aston to stroke its way to the finish.

But Scuderia Ferrari were not the only people suffering. In actual fact, Porsche suffered worst of all. At least several GT Ferraris finished the race, but not a single Porsche crossed the finish line at Le Mans this year. Various and sundry troubles plagued them: valve trouble, broken crankshaft on one car, broken gear shift linkage on another, almost leading one to surmise that the RSK engines are running too hot these days with the oil cooling not doing the job its supposed to.

Naturally, Ecurie Ecosse were on hand and Wilki Wilkinson was particularly proud of the Tojeiro-Jaguar; a completely new engine had been built up around a 2.4 Jag block and was putting out close to 270 horses in a car weighing just over 1700 pounds. Its low frontal area and clean line made it easily the prettiest car in the race. Driven by Flockhart and Lawrence, the "Toj" blew a head gasket after having given a fairly good account of itself. The two Listers, both with power brakes fitted to the rear wheels, looked more like airplanes than they did racing cars while the Aston-Martin DBR1's had the most complicated of all cockpits. The DB-4 coupe was by far the noisiest car on the circuit. It broke its engine in the first part of the race, possessing a short stroke version of the DBR3 and a five speed box out of a DBR2.

Three Triumph TR-3 plastic-bodied twin cam cars were on hand but unfortunately none finished. On two of them, the fan flew into the radiator, while the third hit a dog on the Mulsanne straight.

Colin Chapman had entered two cars, both privately owned however. One was a 2.5 liter MK. 15 with Formula I gear-

box while the other was a 750 cc MK. 17. The big one blew its engine as did the smaller, but Chapman could be pleased with a repeat performance on the part of Elite owners Lumsden and Riley; the same car had won its class on the Nurburgring just two weeks before, but in the meantime had received a new engine as well as other modifications including aluminum brake calipers. One Elite burned during the race, the driver luckily was unhurt but the remains looked like charred Shredded Wheat.

Thanks to the complete absence of rain, the race proved to be a safe one. There is, however, still no justification for the huge difference in speeds that exist at Le Mans. Prime offenders this time were the two Saabs and the DB's. There's considerable pressure being brought onto the organizers of the race to create a new Formula, preferably for GT cars — at least with these the rate of attrition might not be so high. Not all the drivers have the strength of character of Tony Brooks who refused to drive at Le Mans again because of the inherent dangers.

Crowds were bigger than ever this year, and just as disinterested in the race. Perhaps that is the one solid justification for continuing the Le Mans 24-hour ordeal.

*—jla*

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**by Karl Ludvigsen**

**The last chapter of Ludvigsen's mammoth work on competition binders contains additional information on discs and some conclusions by the author.**

## *Debonair Dauphine*

*(Continued from page 69)*

by the 'Dauphine-Gordini' flashes adorning the trunk lid and front fenders.

Rudd doesn't attempt any lily gilding in the transmission department because Gordini got in ahead of him with a long-felt want. The regular Renault is of course a three-speeder, with an excruciating gap of 8.31 ratios between low and second. Amedée's answer is an enchanting close-ratio four-speed box with synchro on the three upper gears and marred only by a shift lever that is too whippy and too far forward for comfortable reach by a driver of average build. Until you get used to it, engaging reverse is an elusive knack calling for an almost brutal sideswipe. But the fourth forward ratio is an enormous asset, playing a major part in the modified car's much reduced through-the-box acceleration times.

These times compare strikingly with figures for a stock Dauphine. Here are some sample undercuts: — zero to 30 mph, 2.9 secs. saved; to 40 mph, 3.7 secs.; to 50 mph, 7.4 secs.; to 60 mph, 14.4 secs.; to 70 mph, 44.7 secs. (The benefit of any doubt that might exist here, incidentally, favors the normal car; the subtractions quoted are based on *SCI's* standard Dauphine roadtest, which produced better results than British and French contemporaries.')

As far as could be judged by our test experience, Rudd isn't crowding the Dauphine's limit of sufferance in raising the output by the drastic margin of 66 percent. This impression is confirmed by the reliability it has so far shown in the circuit races and hillclimbs that the same car is regularly contesting at the rate of two or three per month. Matched in these affrays against BMC meal with 100 cc advantage in displacement, either correspondingly or even more radically hopped, the Renault scores in initial takeoff but can't hold the pick of the competition on course where maximum speed is the decisive factor.

On ruthless standing starts, using everything it's got, the modified Dauphine gives you quite a hit in the hypotenuse — a getaway completely belying its sublitre capacity. Here, of course, it is helped by its rear independent springing and back-end weight bias, the former imparting equal grip on both wheels, the latter aiding gravity in the place it can best use such aid. As tested and timed, with two persons aboard, the power/weight ratio was 68 bhp per ton. Unladen, the back wheels carry just over 60% of the car's weight. A further important factor, accelerationwise, is the Dauphine's extremely low rolling resistance; admittedly with the tires pumped harder than standard (more of this later) on level pavement you can push this dapper little sparrow along with one finger.

Unforewarned — through our own oversight — that the tuned engine peaks at 5750 rpm, and in the absence of a red line on the tacho, we repeatedly took the revs past 6400, and once approached 7000, during the acceleration timings. There was no protest, nothing to suggest the crank wasn't liking it. Right up the scale, indeed, vibration remains at a very low level by any

four-cylinder standard. Naturally, with straight through silencers and the increased volume of the whole exhaust system, noise is considerably magnified, probably doubled at the faster turnovers. Mechanically, though, the engine seems as quiet as ever.

As commonly happens when throttle operation is via cased cables, this line of communication developed an intermittent lumpiness during the test, making it sometimes difficult to give it anything without giving it too much. The idle also indulged in unwanted self-adjustment, raising the tickover from a normal 800 to more than twice that. But these auxiliary malfunctions — rectifiable in minutes anyway — reflect no discredit on the engine conversion job itself, for which we formed a real respect.

The Renault could, we found, be driven indefinitely without sign of stress at an indicated 75 mph (say 67 to 68 gospel) holding an oil temperature around 65 deg. C and a pressure of 45 psi. Water temperature wasn't so exactly assessable, being recorded on one of Renault's original-equipment instruments — segmented in gold, green and red to denote "cold", "normal", "hot". For us, the pointer stayed at green, whatever Centigradation that might signify. Assuming the tach to be accurate or thereabouts, the Dauphine proved to be slightly but perhaps salutarily overgeared, showing a top reading of 5600 rpm at the end of our fastest flying quarter-mile. Without going to the expense of raising the final drive ratio, there is thus a margin in hand for the further power boosting projects the Rudd company have on the hob.

These include lifting the displacement to 905 cc with oversize cylinder liners and fitting a new camshaft that's presently under development. The latter is expected to yield an extra 5 bhp and raise the peak to around 6500 rpm, but at the expense of some bottom-end herbs. The camshaft on the car we tried gives excellent torque low down, evidenced by the spectacular improvement in acceleration times from nothing to 30 and 40 mph. At 3500 rpm, the modified engine generates 1½-bhp more than the standard plant's maximum at its peak speed of 4500.

For better acceleration still, a lightened flywheel (4 pounds off) is among the upcoming *pièces à option*. So is a fully balanced crankshaft (probably necessary with the prospect of sustaining more than 6000 rpm in competition.) So too is an oversize sump incorporating a simple heat-exchange oil cooler, with lengthwise air tubes running through the base, and a scoop at the front to collect any cold climate it can reach.

Driven as we drove it, hard at any time and with the customary brutality during performance timings, the Dauphine's fuel consumption averaged just over 30-miles per U.S. gallon, a 16.3% increase compared with the stock model *SCI* tested earlier. The car we borrowed having the higher of the two compression options, 9.5/1, we took Rudd's advice and used super grade gas. It likely wouldn't have relished anything less, though it certainly was fully detonation-proof on the expensive diet we did give it. —*dm*

## *Fiat Abarth Bialbero*

*(Continued from page 33)*

appetite for sparkplugs. The light exhaust deposits appeared again, showing that the fuel/air mixture that was adequate for the road was totally inadequate on the race course. This time it went to John Fitch Motors in Lakeville near Lime Rock for a further jet drilling and a set of new plugs. Once this was done it behaved quite nicely and the performance testing was run through without a hitch. Weber carburetors of the racing type are finicky things. A change in temperature or humidity means a change in adjustment, sometimes minor and sometimes major and the owner must be prepared for this in return for the high performance the properly set Weber gives on an engine of this caliber.

One thing puzzled us until we asked about it. For all its sizzling performance, the Bialbero still carries the Fiat 600 brakes. More than enough for the 600, and even the Derivazione Abarth, and just barely adequate on the standard Abarth Zagato, these miniscule binders just sort of chatter and retard the Bialbero enough to get into the next lower gear and that is about all. This, naturally is not only puzzling but annoying to the enthusiast who would use all the power and speed available in this car. Taking the car into a corner after a good head of steam has been built up on a straight is an exercise in fast and early downshifting with a bit of praying thrown in for good measure. One feels that only the hand of a deity will slow the car down to cornering speed.

The reason behind this is not oversight on Abarth's part. It is simply that bigger drum-type binders could throw the light suspension out of whack. This is still a *Derivazione* sort of car, not one designed from scratch and as such is equipped with production derived suspension. Abarth is experimenting at a feverish pace to remedy this. In the meantime, one can only speed up one's own reactions and shifting speed. And, perhaps, get over the feeling that it's a disgrace to shut off before the hundred yard marker.

It is tremendously hard to evaluate a car like the Bialbero. For the enthusiast who wants sizzling performance in a small package, the Abarth Bialbero is about as perfect a tool for the job as the price will buy. For the luke-warm enthusiast who also likes good things in small packages but who is not willing to put up with plug and jet changes, the Bialbero is a bit too much car; this man would be far, far happier with the more docile and useable 750 Zagato rocker-box version. However, if you are willing to abide by the temperament of an engine that gets 60 horses out of 45 small cubic inches in return for sizzling performance and the satisfaction of owning one of the most distinctive little machines in the world and don't feel that you must submit the car to the rigors of a workaday world the Abarth Zagato Record Monza, to give it its full name, may well be the car for you.

—*jpc*

## *Carrera In Competition*

*(Continued from page 65)*

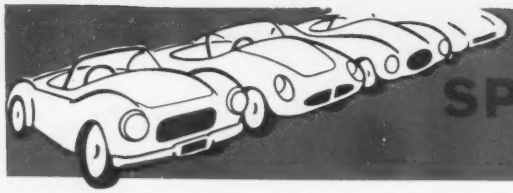
properly. But the Porsche Carrera can be drifed. Here is how I do it. . . .

At position number one I flick the steering wheel sharply to the right and get on the gas hard enough to break the rear wheels loose slightly. This forces the rear wheels out to the left so that the nose of the car is heading in the direction of the turn. If I fed too much gas here the tail would swing out too sharply or the car might spin out altogether, so what I have to do is to apply just enough power to keep the tail of the car "wishing" to the left but not so much power that it breaks loose completely. This requires constant and delicate throttle feathering, although I try to hold about 4,800-5,000 rpm all the way around the Hook.

Here is where Porsche driving becomes interesting. Once the drift angle is set I could, by steering only with the rear wheels as described above, hold the front wheels almost completely straight around the turn, applying more power to turn the car more as the bend got tighter. But there is a way to go through faster than even that technique will allow. You will note that in position two I am halfway across the road with the tail out just slightly to the left and that at position three I am about two or three feet from the right side of the road, again with the tail just slightly out to the left. Now if I were driving on the throttle alone, I would be able to do only about 55 to 60 mph at this point because if I fed any more power the car would spin. But I *do* feed more power and I keep the angle of the car from becoming too great by starting with the steering wheel cut slightly to the right and then constantly flicking it left, which tends to push the tail in the opposite direction than the power is pushing it. You can call this a "sawing" technique if you like but I don't think it really is sawing. To me, sawing is the act of jiggling the wheel quickly left and right, with equal force in both directions, so as to create extra tire friction to slow the car down when you have come into a turn too fast, or when the road surface begins to get uneven. But I am not trying to slow the car down; I am trying to make it go faster. My flicking of the wheel is done so quickly that it probably looks like sawing from outside the car but what I am actually doing (when I am negotiating this turn correctly) is constantly correcting against the tail slide that the excess power is tending to force the car into.

At position four there is another big decision to make. Do you want to try to stay as far to the right as possible, so as to avoid the possibility of anyone taking your line on the inside, or do you want to use up the whole road? Probably the most important consideration here is the weight of the car. The road has been widened on the outside of the Hook, but the additional strips of blacktop slant downhill and if you get on that slope with a heavy car—one that weighs 2,000 lbs. or more—you will have to work too hard to

*(Continued on page 97)*



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## *Carrera In Competition*

*(Continued from page 95)*

get back again, if indeed you do get back again at high speed. But the Porsche weighs only 1,600 lbs. so that is no problem. Besides, I feel that by using the entire road width at this point I can keep my speed a good five mph higher than the tightest part of the Hook. If I am going faster than the car trying to overtake me I don't really care who gets the inside lane. Even if the other car can accelerate out of that inside lane faster than the Porsche, so that he is able to pull alongside in the short straight before the next turn, I will still have something of an advantage over him. This is because the turn that follows the Hook is a left hander and any car coming into that turn to my right would be on the outside of the Porsche; all things being equal, he would have to yield at some point around the turn. Only if he were able to reach the Esses with a clear lead of perhaps a car length would he have gained anything by passing me on the inside of the Hook, and in the very short straight that exists, this is unlikely unless I overdo things completely on the Hook and spin—or go off the road.

My decision, there, at point four, is to go wide and keep my speed up, but since the bend begins to tighten here and since I want to end up at position six facing diagonally across the road for the best approach to the Esses, I want to increase the angle of my drift. I do this by adding more power so that at position five the car is about three feet from the left-hand edge of the road in front and about two feet away in back. From here I begin to come out of the drift although between positions five and six I allow the tail to swing just a bit further until, at position six, I am at my furthest outside point and ready to straighten out. I stop the drifting attitude of the car by twisting the wheel hard to the left, at position five, holding it there, and then, at position six, getting off the gas for a second, straightening out the front wheels and getting back on the throttle hard. What actually happens at position six is that for an instant the drift does become a slide but this, in conjunction with backing off on the gas, allows the wheels to take a better bite within a few feet. The result is this: when I get back on the gas again there is a minimum of wheelspin and the maximum amount of acceleration.

I am already halfway back to the right side of the road at position seven since, as already noted, I want to approach the left bend (part of the Esses) from the right. The thing to remember when you go into any turn is where you want to be when you come out. Coming out of the left-hand sweep of the Esses (position 14) you will want to be on the left side of the road so as to be in good position for the approach for the next right turn.

All right, then, what is the fastest way to get from position 8 to position 14? First of all, you don't want to head to the left (inside) of the turn too soon. This is because the turn is so long that if you went to the outside at position 8 or

*(Continued on page 98)*

## *Carrera In Competition*

*(Continued from page 97)*

9 you would have to slow down a great deal to keep from drifting or sliding all the way across the road (or off it altogether) at position 12 or 13. What you have to do is to figure out some way of having less of a curve to go around once you start your drift. Here is how I do it: I think you will find, by the way, that my line through here is not so very different from that taken by any front-engined, understeering car, but my method of holding the line is quite different.

At point eight I jab once at the brake, then get on the gas hard, at the same time twisting the wheel violently to the left, about one car-length ahead, at point 9. This causes the back end to come around and sets up a drift (at about 65 mph) with the car moving almost directly parallel to the sides of the road but facing to the left and around the turn. Here I really get on the gas hard to maintain the drift but at position 10 — which is reached only a second after you "toss" the car — I cut the front wheels hard to the right to keep the car from spinning out. You see, the Porsche is oversteering strongly here which means that the front end wants to head into the turn (left) and the rear end wants to swing out further to the right. An understeering car would, at this point, be sliding right from the front wheels as well and you would have to keep steering to the left to hold the car on the correct line. But when you apply full power in the Porsche here (still in third gear) to keep the revs and your speed up you are creating more and more oversteer; to correct for this you must keep steering to the right to keep the car from spinning. What I do, then, is to keep whipping the wheel to the right in a constant series of corrections, just as I did to keep the car from spinning out when I increased my throttle setting going through the hook. The difference here is that the road is wider and the curve is more gradual so I don't have to feather the throttle as much, but can control the angle of drift with the steering wheel. At position 11 I am five or six feet from the left side of the road and if I wanted to stay that close to the left side all the way around to point 14 I would have to slow down. So instead I allow the car to drift out just past the center of the road and don't begin to come out of the drift until I am just past position 12. Then I back off on the gas long enough to take a good bite, straighten out the wheels and begin to feed power once more as I steer slightly left and begin to accelerate again into position 14. This brings us to the end of our numbered sequence.

The basic techniques described here can be applied to driving the Porsche around almost any turn on any race course. Speeds would vary, of course, and so would your throttle and steering wheel settings in relation to the width of the road, angle of the curve, type of road surface, etc. For tires I use Continental Super Records with 29 psi in front and 34 in the rear, but you might want to change this to suit conditions or your own particular driving style.

*—pp*

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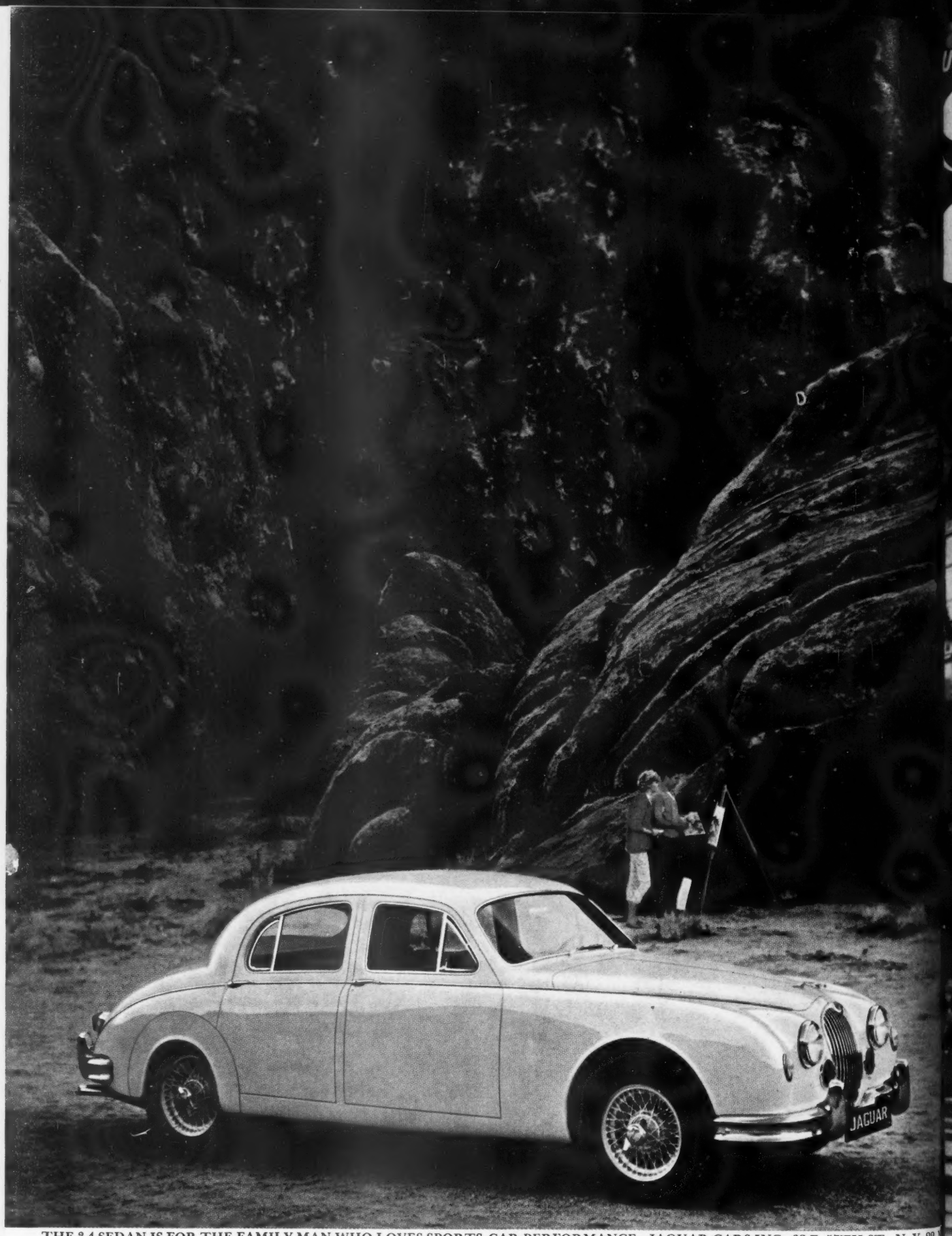


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